CONTRACT FARMING SUPPLY CHAIN RELATIONSHIP AND BUSINESS PERFORMANCE WITHIN MALAYSIAN POULTRY INDUSTRY

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ABSTRACT

Agriculture is one of the key sectors for international trade that supply food to the world population. Further improvement would be strengthening the contract farming system at the operation level and improving the profitability of producers. Measuring business performance provides the required information to the management for effective decision- making and is used by businesses to evaluate progress against objectives in an assessable coordination. This study highlighted the impact of Supplier Involvement and Customer Involvement, later termed as Integrator Involvement (II) and Grower Involvement (GI) in contract broiler production. The research then focused on determining the relationship between integrator involvements and grower involvements moderated by managerial skill towards business performance. This would enable improved contribution of the broiler - farming system in the country and boost profit. The data for this research was collected through mail survey questionnaires from 285 contract broiler producers in Malaysia. The content was validated by experts from the Department of Veterinary Services of Malaysia, and analyzed using the SPSS Version 19 (Statistical Package for Social Science) software. Then correlation and hierarchical regression analysis were done to gauge the preliminary results and relationship between the variables. The research also identified the theory and practice gaps applicable to broiler - contract farming and provided moderating - effect explanations linking those gaps. The result thus derived, suggests that in order for businesses to capitalize and benefit from the working skills, companies need to train their staff in technical and administrative fields. Hence, this study empirically demonstrated its importance and urged the firms to focus on it when applying managerial skills. Staff equipped with better innovative knowledge and managerial skills would be able to deliver operational efficiency and affirm that enhanced managerial skills would be able to strengthen the companies' ability to augment business performance.

Keywords: integrator involvements, grower involvements, managerial skills, business performance, poultry.

ABSTRAK

Pertanian merupakan salah satu sektor penting yang menyumbang kepada perdagangan antarabangsa yang turut menjamin kelangsungan bekalan makanan kepada populasi dunia. Penambahbaikan akan memperkasakan sistem perladangan secara kontrak pada peringkat operasi dan meningkatkan lagi keuntungan kepada pihak pengeluar. Kajian ini memfokuskan kepada penglibatan pembekal dan pelanggan yang kemudiannya dikenali sebagai penglibatan integrator dan penglibatan pengeluar dalam sistem penternakan ayam daging secara kontrak. Kajian ini juga menentukan hubungan antara penglibatan integrator dan pengeluar serta kesan pengaruh kemahiran pengurusan terhadap prestasi perniagaan. Seterusnya, penambahbaikan dalam kajian ini dapat meningkatkan sumbangan sistem penternakan dalam negara pada masa yang sama meningkatkan keuntungan yang diperolehi. Bagi meningkatkan daya saing syarikat adalah wajar diberi penekanan terhadap kemahiran pengurusan dalam kalangan kakitangan syarikat terutamanya kemahiran teknikal dan pengurusan. Hal ini dapat mengelakkan dan mengurangkan aktiviti yang tidak diperlukan dalam meningkatkan lagi daya kompetitif perniagaan dan mengurangkan lebihan kos. Sejumlah 285 data dalam kajian ini diperolehi melalui borang soal selidik yang dihantar secara pos kepada pengeluar ayam daging secara kontrak di Malaysia. Kandungan soal selidik tersebut turut mendapat pandangan daripada pakar di Jabatan Perkhidmatan Veterinar Malaysia. Dapatan kajian diperolehi melalui ujian kolerasi dan regresi dengan menggunakan perisian SPSS versi 19. Kajian ini juga mengenal pasti jurang antara teori dan praktikal bagi menjelaskan pengaruh kemahiran pengurusan dalam pelaksanaan penternakan ayam daging secara kontrak. Hasil kajian ini turut mencadangkan supaya kemahiran teknikal dan pengurusan diberikan penekanan. Di samping itu, terdapat hubungan yang positif antara pemboleh ubah bebas dengan prestasi perniagaan dan kesan pengaruh kemahiran pengurusan. Pengetahuan untuk menjana idea inovasi perlu disemai dalam kalangan kakitangan syarikat supaya kecekapan operasi perniagaan dapat dipertingkatkan; di samping penekanan kepada kemahiran pengurusan perniagaan yang lebih baik berupaya menjadikan syarikat lebih berdaya saing pada masa hadapan.

Kata kunci: penglibatan integrator, penglibatan pengeluar, kemahiran pengurusan, prestasi perniagaan, ternakan ayam

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OPERATIONAL DEFINITION

Broiler	Chickens bred and raised specifically for meat production
Broiler breed	Type of chicken that are typically quick to mature and produce excellent quality chicken meat
Broiler farms	Farms are where chickens are grown for the purpose of producing chicken meat
Business performance	Processes that enables the management of an organization's performance to achieve one or more pre-selected goals
Butchers	Person who may slaughter animals, dress their flesh, sell their meat or do any combination of these three tasks
Contract farming	Agricultural production carried out according to an agreement between a buyer and farmers, which establishes conditions for the production and marketing of a farm product or products
D.O.C	Day Old Chicks
Ex-farm price	Price at the farm gate, not including delivery
Grower	A person who grows a particular type of crop/livestock
Hatcheries	Facilities where eggs are hatched under artificial conditions, especially those of fish or poultry
Integrator	Intermediaries between the chicken farmer and the buyer (supplier)
Internal Coordination	Working group members that involved in projects as they want, and commit their energies specifically to the tasks that are needed to help make projects and events a success
Livestock	Farm animals regarded as an asset
Involvement	The fact or condition of being involved with or participating in something
Logistics Management	Plans, implements, and controls the efficient, effective, forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirements

Managerial skills	The ability to make business decisions and lead subordinates within a company. Three most common skills include: 1) human skills - the ability to interact and motivate; 2) technical skills - the knowledge and proficiency in the trade; and 3) conceptual skills - the ability to understand concepts, develop ideas and implement strategies. Competencies include communication ability, response behavior and negotiation tactics.
Parent stock	Broiler breeder farms raise parent stock which produce fertilized eggs
Poultry	Domestic fowl, such as chickens, turkeys, ducks, and geese
Poultry feed	Food for farm poultry, including chickens, ducks, geese and other domestic birds
Poultry breeders	Persons who are related to raising and breeding of birds
Poultry Processor	Preparation of meat from various types of fowl for consumption by humans
Product Innovativeness	The development of new products, changes in design of established products, or use of new materials or components in the manufacture of established products
Product Modularity	Product systems are deemed "modular", for example, when they can be decomposed into a number of components that may be mixed and matched in a variety of configurations
Service provider	Provides organizations with consulting, legal, real estate, education, communications, storage, processing, and many other services
Vertical integration	Vertically integrated companies in a supply chain are united through a common owner

ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
AFTA	Asian Free Trade Area
DVS	Department of Veterinary Services
D.O.C	Day old Chick's
EFA	Exploratory Factor Analysis
HPAI	Highly Pathogenic Avian Influenza
KFC	Kentucky Fried Chicken
MyCC	Malaysia Competition Commission
QSR	Quick Service Restaurants
SCM	Supply Chain Management
SME	Small Medium Enterprises
SPSS	Statistical Package for Social Science
USDA	Agriculture and Trade Reports
WPSA	World Poultry Science Association
WTO	World Trade Organisation
APICS	American Production and Inventory Control Society
CSCMP	Council of Supply Chain Management Professionals
ITESCM	Integrated Tertiary Educational Supply Chain Management
FAO	Food Agriculture Organisation of the United Nations
USA	United States of America
GATT	General Agreement on Tariffs and Trade
EU	European Union

SC	Supply Chain
TQM	Total Quality Management
TCA	Transaction Cost Analysis
NP	Network Perspective
RBV	Resource-based view
PM	Product Modularity
IC	Internal Coordination
PI	Product Innovativeness
II	Integrator Involvement
GI	Grower Involvement
BP	Business Performance
ROI	Return on Investment
ROS	Return on Sales
ROE	Return on Equity
NPF	Net Profit Performance
SGP	Sales Growth Performance
CSP	Grower Satisfaction Performance
LTP	Lead Time Performance
SME	Small Medium Enterprise
COGS	Cost of Goods Sold
ROA	Return on Asset
MS	Managerial Skills
GDP	Gross Domestic Product
CPD	Grower Involvement in Product Development

BP	Business Performance
CFA	Confirmatory Factor Analysis
MD	Managing Director
JETRO	Japan External Trade Organization
MNCs	Multinational Corporation
CEO	Chief Executive Officer
PCA	Component Analysis
KMO	Kaiser-Meyer-Olkin
VIF	Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The introduction to the study is discussed in this chapter. An overview of the study is presented, followed by the problem statement. The research objectives are then proposed, followed by the scope and significance of the study. The highlights of this chapter include the current situation of the poultry industry in Malaysia, the research motivation and goals, and the significant contribution of this study.

Over the last thirty years, there has been an accelerated hike in livestock production globally. According to Delgado *et al.* (1999), economists agree that the increase in livestock production was prompted by rising demand due to a growth in populations and higher per capita incomes. With regard to contracts, the economic links between companies and those in the farming industry have increased exceptionally in the last two decades. Studies on contract farming in Asia and Africa by Barret, Ilbery, Browne and Binns (1999), Glover and Teck Ghee (1992), Little and Watts (1994), and White (1997) illustrate the development of this occurrence, although the levels of the contract relationships in these territories are not as marked as in Latin America. According to Murray (2001), the contract relationships have slowly been extended throughout the world. For example, suppliers of pumpkins in New Zealand obtain their produce from pumpkin growers in Tonga, and sell the final product to buyers and consumers in Kobe,

Japan. The form of the contract itself has been internationalized to mirror, sustain and promote agriculture and globalization, which are both inter-connected.

Flexible contract farming is a reciprocal integration model that enables companies to have greater control over the yield of farm produce. The vertical integration represents such a model, except that it excludes the responsibilities which come with the possession of the various stages or points of production. In exchange for an assured market for his produce, the grower consents to follow a pre-determined set of production procedures under the supervision of the purchaser (Reynolds, 2000). Usually the technical support and services come from the purchasers, while the growers contribute in terms of the necessary farmland and manpower.

The contract has developed into a form of socio-economic relationship because of certain historical aspects, and it can be viewed as being part of the larger industrialization process and the related vertical integration of agricultural development. Whatmore (2003) argues that the growth of agribusiness has been widely documented as a reminder of the massive changes that have taken place over the last five decades in terms of the attributes of farming. Furthermore, the production of commodities as large scale investments, which have typically come from international sources, have been required to expand control into numerous product chains and developments. Agribusinesses have attempted to reduce labour costs, provide cheaper natural resources, lower transaction expenditure, including the transfer of risk, by engaging contract farmers.

As mentioned earlier, the changes are especially obvious in Latin America (Barham, Clark, Katz, & Schurman, 1992; Murray, 2002), and obviously such areas were marked out for development so as to mitigate the effects of the debt crisis that hit in the early

1980s. Contract farming has also been linked specifically with the increase in cross-border exports of unconventional agricultural products, which have been encouraged as part of a critical plan to implement structural adjustment programs in Latin America starting in the 1980s. As suggested by Watts and Hahn (1993), some people have viewed this as a vital factor in the evolution of a more novel global division of labour and the advancement of an agricultural system which is international in latitude and adaptable in structure.

The outcomes of the nature of contract farming, and in certain cases its distribution, have given rise to a lot of arguments and disagreements, and certain parties have debated that the structure of the relationship between businesses and farms have resulted in many prospective gains for large scale businesses. With contract farming, the transaction costs can be reduced by the provision of a secure market; growers are faced with fewer risks as variations in prices, which are linked to changes in quantity in the commodity markets, are reduced; and the transfer of technology is encouraged. Possibly what is most significant is that the contract system is able to offer financial facilities to growers who, if not for the contract, might not be able to gain access to traditional markets. Previously, according to Glover (1987), many debated that perhaps extending credit facilities was the predominant reason why small-scale producers on the side-lines were willing to step into farm contracts. Later (Goldsmith, Salvadoe, Knipe & Kendall, 2002; Key & Runsten, 1999), have reiterated that contract farming can benefit both sides as they are prepared to share the risk and to reduce transaction costs. Many, however, are not in favour of dealings by contract as they claim that they are especially biased against small-scale

producers (D. Glover & Teck Ghee, 1992; Little & Watts, 1994; Murray, 1997; Wilson, 1986).

In Malaysia, the poultry industry is comprised of two categories of producers, namely commercial farms and conventional farms. Commercial farms carry out business with an integrator according to a contract, while conventional farms belong to independent businesspersons. According to Ariffin, A.S., Lamsali, H., and Mohtar, S. (2012a) the capability of the contract method to support businesses is more likely to ensure its continuity rather than its ability to manufacture products at reasonable costs. There were 3,300 farms operating in 2009 with a standing population of almost 186 million broiler chickens. 22.9% of these farms were huge farms with more than 50,000 broiler chickens in each cycle, while 26.2% were medium-sized farms with between 20,000 to 50,000 broiler chickens in each cycle, and the remainder were small farms with 20,000 broiler chickens in each cycle. According to Ariffin *et al.*, (2013) the states of Johor, Sarawak and Perak are the major producers of broilers, which constitute 52% of the total national production. Malaysia is 121.8% self-sufficient in the supply of poultry meat. Most of the meat is consumed fresh. It is the main type of meat consumed in the country, accounting for 70% of the total meat consumption. Out of the total amount of poultry meat for local production, a mere 9% is set aside for further processing. However, the processing firms, in their bid to maximize production, are relying more on imported poultry meat as it is cheaper. Actually, the poultry that is processed mostly comes from imported meat.

Apart of broilers, there is a growing niche market for indigenous cross-bred chickens. These chickens are produced by an estimated 80 commercial and semi-commercial farms, which are practising a semi-intensive system, carrying capacities of 5,000 – 20,000

chickens per cycle. There is also the backyard farming of indigenous chickens, involving about 1,200 farmers, but most of this is subsistence farming rather than for commercial purposes. However, this subsector contributes only 1% to the national production of poultry meat. Similar to the situation with eggs, the "excess supply" is mainly exported to Singapore, where the growing demand for fresh livestock products is advantageous to Malaysia due to its geographical proximity. According to Ariffin *et al.,* (2013) the broiler industry was enjoying immense protection under import prohibitions and quantitative limitations before WTO and AFTA stepped in. Thus, the industry is now encountering competitiveness as a major challenge. Currently, some products are under tariff rate quotas. In this respect, transforming the small scale farms to more capital-intensive, medium and large scale farms is a major initiative that is needed by the industry to enhance productivity and competitiveness to sustain the industry in a more liberalized market. In moving towards a more liberalized market, the government has abolished price controls on broiler and broiler products since the middle of 2008, which before this was controlled in every part of the supply chain. As suggested by Ariffin *et al.,* (2012b) another challenge for the industry is to cope with the environmental and pollution issues associated with its production system. In this respect, the government has provided incentives for producers to upgrade their production system from the open system to the more efficient and environmentally-friendly closed house system of production.

According to DVS (2013), the industry reported a production of 673.87 million day-old chicks and 637.00 million broilers in 2012. For 2013, a production of 770.22 million day-old chicks and 720.11 million broilers was projected. In 2012, there were 23 broiler parent stock companies operating with yearly production volumes of between 1.38

million to 158.7 million day-old chicks. The standing parent stock population in 2012 was about 5.66 million birds. Cobbs and Ross were the principal breeds accounting for 96.6% of the entire parent stock, while the rest comprised Arbor Acres and Indian River breeds. Locally-produced parent stock accounted for 93.0% of the total parent stock population. The monthly ex-farm price of day-old chicks fluctuated between RM0.90 and RM1.95 per chick with an annual average of RM1.33 per chick. The monthly ex-farm prices for broilers fluctuated between RM3.20 and RM5.50 per kilogram live weight with an annual average of RM4.30 per kilogram. The cost of production of broilers was between RM4.72 and RM5.09 per kilogram. The export of live broilers in 2012 was 42.78 million birds, showing a 7.16% decrease from that of the previous year. The import of chicken cuts in 2012 increased by 4.6% from 2011.

Industry Performance Production, Consumption and Trade

For the past 10 years, between the years 2000 to 2009, the average annual growth in production was 7.9%, from 714,270 metric tons to 1,226,500 metric tons. Domestic consumption grew at a lower rate of 6.5% per year, from 635,210 metric tons to 1,007,140 metric tons (Table 1.1).

Table: 1. 1
Broiler Production and Domestic Consumption

Year	Production (000 m.t)	Consumption (000 m.t)
2000	714.27	635.21
2001	766.55	673.11
2002	855.44	789.97
2003	859.59	797.85
2004	927.49	860.39
2005	980.05	785.66
2006	1035.40	828.73
2007	1100.00	903.36
2008	1162.57	953.36
2009	1126.50	1007.14

Source: Department of Veterinary Services, Putrajaya (2013)

Trade

Tables 1.2 and 1.3 show the imports and exports of day-old-chicks, live and processed poultry respectively. Malaysia is a net importer for day-old-chicks and processed poultry meat but a net exporter in live poultry. Processed poultry meat showed a steady increase in imports as the government increasingly liberalized its imports into the country.

Table: 1. 2

Total Poultry Import (1999 – 2008)

Year	Day Old Chicks (No)	Fowl and Poultry (no)	Poultry meat (processed) (m.t)
1999	213,428	19,065	22,903
2000	2,159,431	20,058	25,204
2001	19,695,742	45,966	40,042
2002	10,652,840	103,455	54,184
2003	7,271,876	66,200	42,426
2004	6,147,248	64,054	19,898
2005	5,988,100	6,844	21,455
2006	4,772,402	5,010	19,867
2007	5,699,699	81,040	37,597
2008	4,029,233	11,418	40,034

Source: Department of Veterinary Services, Putrajaya (2013)

Table: 1. 3
Total Poultry Exports (1999 – 2008)

Year	Day Old Chicks (No)	Fowl and Poultry (no)	Poultry meat (processed) (m.t)
1999	5,398,906	46,270,556	6,534
2000	5,597,995	47,289,509	6,717
2001	6,342,037	45,654,097	9,430
2002	7,031,811	47,051,670	12,910
2003	3,205,886	45,115,817	14,540
2004	1,249,269	34,864,762	9,850
2005	2,109,157	37,679,531	4,686
2006	2,108,618	37,567,183	5,379
2007	1,807,418	40,808,127	6,532
2008	2,457,610	33,912,652	13,935

Source: Department of Veterinary Services, Putrajaya (2013)

Production Capacity

The annual production capacity of day-old chicks by the breeder companies varied. The smallest company produced about 4.07 million day-old chicks and the largest produced about 158.7 million day-old chicks (Table 1.4).

Table: 1. 4
Annual Production Capacity of Broiler Parent Stock Companies

Annual Production Capacity (million Chicks)	Number of Companies (2010)	Number of Companies (2011)	Number of Companies (2012)
1 to < 5	7	3	5
5 to < 10	8	5	5
10 to < 20	4	5	5
20 to < 40	3	3	2
40 to < 80	2	6	4
80 to < 120	0	0	1
> 120	1	1	1
Total	**25**	**23**	23

Source: Department of Veterinary Services, Putrajaya (2013)

Standing Population

The total standing parent stock population in June 2012 was 5.66 million birds and 6.35 million birds were projected for 2013 (Table 1.5).

Table: 1. 5
Standing Parent Stock Population

Companies	2010	2011	2012	2013 (*forecast*)
Integrators	3,537,614	3,891,308	4,071,804	4,485,968
Non-Integrators	1,320,293	1,448,322	1,589,088	1,861,861
Total	**4,857,907**	**5,339,630**	**5,660,892**	**6,346,829**

Source: Department of Veterinary Services, Putrajaya (2013)

Breeds

The breeds available and their market share in 2012 are shown in Table 5. The principal breeds were Cobb and Ross, accounting for 96.6% of the total population. In 2012, most of the companies used the locally bred Cobbs and Ross (Table 1.6).

Table: 1. 6 *Market Share of Individual Breeds of Broiler Parent Stock*

Breeds	2010	2011	2012	2013
Cobbs	3,370,998	3,806,380	4,176,346	4,594,523
Ross	1,306,322	1,312,480	1,290,105	1,385,345
Arbor Acres	180,587	220,770	194,441	333,106
Indian River	0	0	0	34,855
Hubbard	0	0	0	0
Total	**4,857,907**	**5,339,630**	**5,660,892**	**6,347,829**

Source: Department of Veterinary Services, Putrajaya (2013)

Source of Day-Old Broiler Chicks

The number of day-old chicks produced by the integrators increased by 16.17% compared to the previous year, whilst non-integrators showed an increase of 5.16% compared to 2011. In 2012, the integrators and non-integrators contributed 72.84% and 27.16%, respectively of the total production of day-old broiler chicks (Table 1.7).

Table: 1. 7
Production of Day-old Broiler Chicks by Integrators and Non-Integrators

Year	Integrators (%)	Non-Integrators
2006	55.55	44.45
2007	63.41	36.90
2008	61.24	38.76
2009	71.63	28.37
2010	73.55	26.45
2011	70.75	29.25
2012	72.84	27.16

Source: Department of Veterinary Services, Putrajaya (2013)

Production of Broilers

In 2012, the total production of broilers was 637.00 million birds, with a weekly production ranging from 11.11 million birds to 12.93 million birds. On average, 1.75 million birds were produced on a daily basis, with an increase of 4.17% compared to 2011. The production of broilers for 2013 was projected to be about 720.11 million birds, with an average daily production of 1.97 million birds. A total of 42.78 million live broilers and 13,816 metric tons of raw and marinated chicken meat were exported in 2012 (Table 1.8).

Table: 1. 8
Export of Live Broiler and Chicken Meat

Year	Live Broilers (million birds)	Chicken Meat ('000 m tones)
2009	42.08	0.92
2010	44.93	4.16
2011	46.07	10.60
2012	42.78	13.82

Source: Department of Veterinary Services, Putrajaya (2013)

The cost of production of broilers ranged from RM4.72 to RM5.09 per kilogram live weight. The annual average cost of production was about RM4.83 per kilogram. Throughout the year, the cost of production was higher than the ex-farm price. The cost increment was attributed to the high cost of feed and raw feed materials.

In 2012, there were many issues facing the poultry industry, such as increments in the importation of chicken cuts and products, stronger market access aimed at export excellence, continuous increase of chicken prices, etc. The figures reported have shown that imports of chicken cuts and products increased by about 4.6% compared to 2011.

Such imports are capable of endangering the viability and sustainability of the industry in Malaysia, which has yet to recover from the protracted impact of high production costs. Since local sources are more than adequate to meet domestic requirements (about 128% of self-sufficiency level for chicken/duck meat), the poultry industry has to be innovative, and begin to survey export markets, particularly among the ASEAN member countries in line with the objectives of the ASEAN Free Trade Agreement (AFTA). The implementation of the Poultry Enactment to license the farms has been well received by the industry. Through this enactment, the Veterinary Authority is able to combat issues related to environmental pollution by poultry waste, public nuisance by flies and foul odours causing numerous complaints and also issues regarding poultry welfare. In Malaysia, the dominant segment in the livestock industry is the poultry segment, which supplies more than 80 percent of the total meat requirements of the country. It has been observed that this segment is the most producing segment of the livestock industry, and probably has the highest rate of production in the farming cluster.

According to Ali (2013), Malaysia is one of those countries which consumes the most chicken meat in the world. About 38kg of chicken/duck meat is consumed by each individual. Malaysians consider chicken meat to be the most common and economical source of meat protein mainly because there are no dietary or religious constraints with regard to its consumption. Over the past few years, fast food restaurants such as Kentucky Fried Chicken (KFC), McDonald's, A & W, Kenny Rogers, and Nando's Chickenland (a franchise chain originating from South Africa) have boosted the consumption of chicken in Malaysia.

Nowadays, consumers in Malaysia are demanding that they be sold food that is healthy and of high standards at affordable prices. They are very concerned about food safety and matters pertaining to the 'halal' certification. It should be emphasized that most Muslims will not consume poultry items that have not received the 'halal' certification by the religious authorities in this country.

Furthermore, consumers in Malaysia are very to detect when it comes to prices and are constantly on the lookout for good quality products at economical prices. As such, the poultry industry is faced with a growing challenge to come out with newer and better products at reasonable prices while maintaining the quality.

1.2 Problem Statement

The livestock industry is a vital and essential part of the agricultural sector in Malaysia as it provides jobs for the people and is a source of valuable animal protein, for example, to approximately 29.2 million people in Malaysia and 5.31 million people in Singapore in 2012. Non-ruminants also come under the livestock sector and these include poultry and eggs, with broilers being the most important. It can be shown that the steady growth rate over the years can be attributed basically to the active involvement of the private sector. Within a short space of time, the poultry industry has managed to lift itself from being a backyard industry that was barely able to survive to that of a very modern business with competent and resourceful production methods. Poultry production stood at 115 million tonnes for a per capita consumption of 10.22 kg in 1980, and by 2004 this had increased to 765 million tonnes with a per capita consumption of 38 kg (Ali, 2013). The highest contribution to broiler production was from contract farming, which involved the

integrator and grower. Even though wide-ranging data is available with regard to the commercial performance of manufacturing firms in developed countries, when it comes to Malaysia the empirical evidence on poultry production is inadequate.

The role and importance of poultry for the sustenance of life assumed even greater importance after the Highly Pathogenic Avian Influenza (HPAI) broke out in Asia and Africa (Akunzule, 2006; Baba, 2006; WPSA, 2007). Some countries have attempted to control the HPAI by ensuring that more poultry are concentrated in integrated production systems which have superior standards of bio-security and that free-range production is either reduced or eradicated altogether. This has sparked debates on how the rural incomes have been affected by policies such as these (Branckaert, 2006).

Integrated supply chains gain from a broad gap that enables integrators to ensure production in an efficient way so as to better match supply with demand. Parent/grandparent poultry stocks are imported by hatcheries. The grandparent stocks are kept at individual breeding farms while the parent stocks, which have been imported or brought in from the breeding farms, remain at the hatcheries. Chicks that are a day old are either distributed to company farms, or what are known as contract farms, purchased by other producers (Fallon, 2001).

The contract farms rear the broilers until they reach market weight, which is normally after 40 - 45 days (Na Ranong, 2007). The birds are ready once they attain market weight, and they are then sent to the company slaughterhouse. After being slaughtered, the birds are transported to a processing facility, which is usually located at the same place, to be cut (if necessary), cleaned, trimmed and gutted, processed, and packed. There are some other products that can be processed or put up for sale in the local markets or

wet markets. The whole broilers, together with the quality parts and other extra bits, are delivered to wholesalers before being distributed to the wet markets. Often, a kind of loose verbal agreement exists between wholesalers and wet market retailers with the distributors of broiler meat with regard to the time, quantity and price of normal purchases. Production businesses usually have official supply contracts with certain supermarket chains. Additionally, more and more restaurants and other eateries are also being incorporated into this poultry production system (Costales, Gerber & Steinfeld, 2005).

Although previous studies have shown that contract production is more efficient, there is not much difference in the grower margins of contract and non-contract growers. As such, integrators cannot hope to maintain contract production by reducing the grower margin. It also follows that neither do integrators share the efficiency surplus with growers through higher grower margins (USDA, 2004). However, according to Barrat (2004), there are considerable benefits for contract growers when it comes to risk reduction and even expected income. The latter impact is mainly because poultry integrators approach for contracts only those growers who have poor chances of remaining independent as they are lacking in skills and experience, and have difficulty in obtaining financial assistance. Access to credit facilities is a vital component of a poultry contract. These disadvantaged growers are able to earn as much as the independent growers when they come under contract production. Consequently, the integrator gains from the excess in contract production (compared to purchases from independent growers) while simultaneously providing contract growers with substantial benefits in terms of lower risks and higher profits.

Poultry contracting employs enhanced and consistent technology and production processes which involve the supply of inputs, friendly ties and training of the contract grower. In order to protect this investment (in terms of inputs and training), it is necessary to ensure that growers do not breach their contracts, and that the grower turnover rate is kept to a minimum (Key & Runsten, 1999). So there is an urgent need to address crucial variables empirically for the whole process of broiler production.

Like any other contractual relationship, contract farming also has its naturally and threats. Should either one of the contracting parties fail to respect the terms of the contract, then the affected party will most likely make a defeat. Some of the more usual contractual problems include the grower selling to a buyer other than to the one to whom he has contracted to sell to (selling on the side or marketing beyond the terms of the contract), a company refusing to purchase products at the prices agreed to in the contract, or the buyer lowering the quality of a product. Probably the biggest problem restricting the growth of contract farming is the sale of products on the side to competitive buyers by growers. Integrators may also fail to live up to the terms of the contract when they refuse to pay according to what was agreed to or they purchase less than the amount that was agreed to earlier.

Another worry concerning contract farming is that it presents buyers with an opportunity to gain the upper hand over growers. Businesses, which have purchasing capacity, are obviously in a stronger position than the growers, and may use their bargaining power for their financial gain. Certainly, if the growers are disorganized or there are not many alternative purchasers for the broilers, or if they find it hard to adapt, the growers may end up with the shorter end of the stick. The tactic that are used at times include changing

the standards that were previously agreed to, delivering poorer quality products, thus lowering prices, or over-charging for inputs and transportation. To reduce the chances of exploitation and badly framed contracts and the enforcement of those contracts, it is necessary to empower grower organizations to have greater access to suitable facilities such as credit extension services and market information, and to enhance their skills at negotiating better contracts. It has also been suggested that some form of welfare system, similar to the benefits available in most employment contracts, be instituted for contracted growers. According to Loh (2013), as at September 2013, there were 3,179 broiler farms in Peninsular Malaysia. 60% of the total production comes from Kedah, Pulau Pinang and Perak, which are the top three broiler-producing states. Due to cultural and religious considerations, broiler meat is the main type of meat that is consumed in Peninsula Malaysia. Broilers are chickens that are bred and raised specifically for meat production. This is clearly an industry where SMEs have a large stake in every state of the country. The latest available data shows that the annual consumption of broiler meat rose progressively in 2000 to 2012 from approximately 31kg per capita to approximately 37kg per capita, respectively. Although the steady growth of the broiler industry in Peninsula Malaysia has been promising, yet the hardship by consumers concerning the rising retail prices in wet markets have tarnished this report.

The broiler industry faces many risks in various subsectors. The feed industry plays a major role in determining production costs, contributing 70 percent of the production costs in broilers which are supplied by integrators. Previous research studies have identified the impact of this, which is the focus of this study. This was done to prove that this study can make a value contribution to the broiler industry. It is necessary to

recognise and study numerous areas along the broiler supply chain in order to identify the impact that these areas can have on the supply chain. These areas, among others, comprise the various parties involved in feed inputs, manufacturing and procurement, competitiveness and profitability within the animal feed supply chain, and their overall impact on the poultry market. Input factors further upstream in the supply chain need to be researched, as well as the integrator involvement process and the risk, discounting the efficiency, lower costs and higher quality. The poultry industry is rife with problems emanating from lack of professionalism, due mainly to inadequacy of managerial skills – primarily accounting dexterity. A more recent debate in the financial accounting literature regards the relevance of accountancy managemnt skills for firms of the so-called New Economy (Lopes, 2001). Due to the failure of traditional accounting measures to recognize and measure the intangible assets, it is argued that accountancy will lose relevance for valuation and users' investment decision purposes (Barth, Landsman & Lang, 2008; Iu & Clowes, 2004). While there have been a number of studies on this topic in developed countries (Collins, Maydew and Weiss, 1997; Beisland, Hamberg and Navak, 2010), one is not aware of any expansive study that has explored the subject of value relevance of accountancy management skills. It has not been comprehensively researched primarily because of problems with data availability (Negah 2008). Literature on accountancy management is so scanty and insufficient that it is difficult to determine value relevance of accounting information. Generally, fairly related literature are on accountancy management (Jagetia and Nwadike, 1983); corporate financial reporting (Wallace, 1988); communications in accountancy: problems and solutions (Adeyemi and Ogundele, 2003); relevance of financial statement to stakeholders' investment decisions

(Kantude, 2005); determinants of upward and downward trending of the stock market prices (Nwude, 2010). The above mentioned studies provide no significant validity of existing empirical evidence of of accountancy management skills in the developing countries. As a result, the study attempts to fill the gap in literature by investigating the moderating effect of accountancy management skills to capture or summarize information that affects the business performance poultry sector in Malaysia. Consequently, it is imperative that the poultry sector must focus on improving the accountancy and financial management skills. Previous research has primarily focused on manufacturing part of poultry production and has not targeted the contract farming aspect, in particular; resulting in literature support that contract production is more efficient.

A limited amount of literature was found that included a detailed analysis of the entire supply chain, its stakeholders and its role players from an economic and strategic perspective that combined the structure, conduct and performance of the broiler business in Malaysia. To understand the problems in the broiler industry, a value-chain analysis related to supplier involvement (integrators) and customer involvement (growers), including all the links, needs to be undertaken. Special attention was given to the different parties involved in the input and facilities that have been practicing contract farming. For example, an integrator is a major buyer, manufacturer and seller of feed and other inputs for farming purposes. The concluding remarks in the previous section indicate the importance of integrator and grower involvement in order to produce high quality broilers in the market with sustainable production.

1.3 Research Questions

This study is aimed at answering the following research questions:

i. Do any relationships exist between product innovativeness, product modularity and internal coordination variables with regard to business performance?
ii. Which variable involving the integrator has the greatest impact on the performance of a business?
iii. Which variables between the involvement of the Integrator and the Grower affect business performance?
iv. Does the level of managerial skills have any moderating effect on business performance?

These research questions identify the issues that are to be investigated. Furthermore, these research questions will also explain the concepts which are the focus of this research. Based on the answers to these questions, recommendations will be proposed for improvements to be made in the management of the supply chain for the poultry industry.

1.4 Research Objectives

The objective of this study is to investigate the relationship that exists between integrator involvement and grower involvement with regard to the business performance of the poultry industry, especially in the production of broilers. The study was conducted in all the states in Peninsula Malaysia. Agribusiness is the fastest developing economic activity internationally, being spurred mainly by the rising population and the increasing need for

food. For quite some time now, academic researchers have been concentrating on the agribusiness. However, the theoretical background, implications, references and methodologies which were commonly used in those researches are somewhat different from those used in studies into Supply Chain Management (SCM).

In general, this study has the following main objectives:

i. To examine the relationship between product innovativeness, product modularity and internal coordination variables with regard to business performance.
ii. To examine which variable in integrator involvement has the greatest impact on the business performance.
iii. To determine whether Integrator Involvement or Grower Involvement has the greatest impact on business performance.
iv. To examine the moderating effect of managerial skills variable on the relationship between Integrator Involvement and Grower Involvement with business performance.

1.5 Scope of Study

The research covers all the states in Malaysia, except for Sabah and Sarawak because of the geographical limitations.

i. All growers involved in contract farming are considered as broiler producers.
ii. Integrators involved in the research are considered as suppliers.

iii. The theme of the instruments is designed to specifically address the issues of the poultry industry in Malaysia.

1.6 Significance of the Study

Researches on contract farming indicate that such contractual agreements often fail because of unscrupulous behaviour. At present, some of the agricultural issues are mainly due to poor management and uneconomical methods of broiler production. Thus, changes to agricultural production and optimum use of production factors can be brought about by focusing on the business performance of farms and identifying the factors that influence it (Yaaghubi, Chizari, Pezshkirad & Foeli, 2009). Broiler producers must acquire skills that will enable them to manage their business and to efficiently handle the changes that occur in the agribusiness environment. From the example of poultry farming, it can be seen that contracting is useful when the processor and grower both share the same interests. This study proposes to examine the relationships that exist between the integrator and the grower with regard to their business performance in the field of poultry production.

The part played by the level of skills of the employees as the moderating variable between the independent and dependent variables mentioned above will be discussed. Some of the significant measures in the dependent variable (business performance) include supply chain practices and their consequent performance indicators in terms of broiler production. A research framework will then be proposed based on a comprehensive survey of the related literature. The main contributions to this study within the proposed framework include grower involvement (independent variable),

managerial skills (moderating variable), and supply chain practices. It is hoped that this study will prove to be helpful to the poultry industry and the policymakers concerned, and will add to the growing body of knowledge with regard to the agribusiness supply chain. This study describes the situations under which this orientation is obtained and provides insights for those involved in the poultry meat supply chain. Firstly, it enhances the small, yet expanding body of work that explains the performance of contract growers. Secondly, this research also addresses the benefits accruing from contract schemes between integrators and growers.

1.7 Organization of the Thesis

The thesis is divided into several chapters. In this chapter, an overview of the study is given followed by the problem statement. The research objectives are then proposed followed by the scope and significance of the study. The highlights of this chapter include the current situation facing the poultry industry in Malaysia, the research motivation and goals, and the significant contributions of this study.

Chapter Two covers the concepts, theories and supply chain practices that influence business performance. The research is based on literature reviews. In the first section, the general definition of supply chain management and theories are explained, while in the second section integrator involvement, grower involvement, and their relationship to managerial skills and concepts are defined. The final section is a review of the literature pertaining to basic supply chain practices that enable organisations to develop a flexible value chain that is sensitive to business performance and to remain competitive despite varying levels of conservative pressure.

Chapter Three describes the design methodology, questionnaire development, research ethics and outcomes of the experimental study. Data was collected from broiler industries throughout Malaysia. The research has been designed to support a quantitative empirical analysis.

Chapter Four discusses the results and findings of this study. The details of the survey findings are given in this chapter. The next section presents the response rate, a summary of the respondents, the regression and so on. It gives the demographics or profile of the respondents, a factor analysis and then the dimensions as an outcome of the related variables in this study. Following that, an analysis is conducted through the use of descriptive statistics, correlation and the use of hierarchical regression analysis to test the hypotheses.

The final chapter, Chapter Five, elaborates on the findings thoroughly. It begins with the introduction section that provides an overview of the study. A summary of the study is elaborated further to provide insight as to how the entire study process has been conducted. Next, the concluding findings on the research objectives are delivered. Moreover, this will cover the contributions to the academia and their possible applications in the industry. The theoretical and practical implications of this study are also presented, together with its limitations, recommendations for future research and general conclusions.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter comprises the concepts, theories and supply chain practices that influence business performance. The research is built on the body of literature reviews available. In the first section, the general definition of supply chain management and its theories are discussed. In the second part, integrator involvement, grower involvement and their relationship to managerial skills and concepts are defined. The final section is a review of the literature pertaining to basic supply chain practices that enable organisations to develop a flexible value chain that is responsive to business performance and for staying competitive under different levels of conservative influence.

2.2 The Supply Chain Management (SCM) Perspective

Supply chain management (SCM) has recently become popular among practitioners and academicians (Burgess, Singh & Korogla, 2006). Business competition was strengthened in the 1990s and 2000s in global markets and supply chain management practices have been chartered to deliver the right products, to the right place, at the right time, in the right quantity, quality and condition to the growers at the lowest possible cost (Coyle, Bardi & Langley, 2003; Li Ragu-Nathan & Rao, 2006; Lummus, Duclos & Vokurka, 2003). It has been suggested by Lau (2010) that the recent business environment has been driven by constant changes, market unpredictability (Kim, 2005; Swafford, Ghosh &

Murthy, 2006; Yusuf, Gunasekaran, Adeleye & Sivayoganathan, 2004), rapid technology changes and shorter product life cycle (Hyun & Ahn, 1992). This has resulted in a range of products and inconsistent global demand (Fisher, 1997). According to Porter (1990) and Van Hoek (2001), successful organizations remain competitive through various supply chain channel collaborations while adapting to changing market place conditions (Kumar, Fantazy & Kumar, 2006; Reichhart & Holweg, 2007).

According to La Londe and Bernerd (1997), the term SCM is usually used to describe the responsibilities of corporate executives, and it has become so popular that practically any publication with articles on manufacturing, distribution, customer management or transportation is bound to be about SCM or a topic that has to do with SCM (Ross & Frederick, 1998). As mentioned by Tyndall *et al.* (1998), in operational terms, SCM involves the movement of materials and products. To some people, it is a management philosophy, while to others it is a management process, and some view it as an integrated system. SCM has even been conceptualized by authors within the same article as a management philosophy as well as an integrated system of vertical integration and individual identities (Cooper *et al.*, 1993). Meanwhile Christopher (1994) defines a supply chain as "a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer."

Integrators, manufacturers, distributors, retailers and growers are parts of the supply chain. The growers are the most important part of the chain, since the main reason for the existence of any supply chain is to meet the needs of growers while generating profits for itself in the process (Chopra & Meindl, 2001). Originally, the SCM had to do with the

inventory management within a supply chain. This concept was then extended to cover the management of all the functions within a supply chain. According to Chopra and Meindl (2001), the SCM involves the management of movements between and among different levels in a supply chain to reduce total cost. This implies that the SCM is engaged in the management of the movement of products, information and finance up and down the supply chain. Over time, businesses having highly developed SCM capabilities will benefit the most from radical improvements in grower responsiveness, advanced grower services and satisfaction, better adaptability to changes in market conditions, enhanced retention of growers and more effective marketing (Horvath & Laura, 2001). For Monczka *et al.* (2000), SCM is an idea, "whose primary objective is to integrate and manage the sourcing, flow, and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers". Stevens and Graham (1989) asserted that the aim of SCM was to coordinate the needs of growers with the flow of materials in order to find a compromise between divergent goals of maximum grower service, minimum inventory management, and low unit costs. The supply chain is perceived as a single process, with responsibility for the different sections in the chain being undivided and transferable to functional sectors such as manufacturing, purchasing, distribution, and sales. The SCM requires, and ultimately depends on, strategic decision-making. The common objective of almost every function in the chain is "Supply" and it is especially important strategically because of its impact on costs, profits and market share on the whole. A different perspective of the SCM is needed when it comes to the usage of inventories as a final, not first, option as a balancing mechanism. In this case, a more advanced approach is necessary, one that calls for integration instead of interfacing

(Houlihan & John, 1988). The SCM is bringing out immense economic gains to businesses as varied as manufacturing, retail, and service organizations (Horvath & Laura, 2001). The scope of SCM has been broadened even more to cover recycling (Baatz, 1995). SCM has to do with the overall movement of materials from suppliers to the end users (Jones, Thomas, Daniel, & Riley, 1985). It emphasizes the "total" assimilation of all the stakeholders within the supply chain through a realistic approach which takes into consideration only strategic suppliers and growers in view of the fact that most supply chains are too complicated to completely assimilate all the supply chain elements (Tan, Handfield & Krause, 1998).

Supply chain strategy involves the following: two or more businesses in a supply chain entering into a long term contract; the growth of mutual trust and commitment to the relationship; the incorporation of logistics events which involve the sharing of information concerning demand and supply; the prospects for a change in the centre of control of the logistics procedure (La Londe *et al*., 1994). Manufacturers can develop other conceptual solutions, pick the best components and technologies, and help to evaluate designs by involving integrators early in the design stage (Burt & Soukup, 1985). SCM assimilates logistics into the strategic decisions of the business (Carter & Ferrin, 1995). Ultimately, the philosophy is built and integrated into a common body of knowledge that comprises all the value added activities of the manufacturers and logistics providers (Tan, 2001). As suggested by Frohlich *et al.* (1997), several SCM strategic models have been examined in an effort to identify their vital role in overall strategic corporate planning. Experts are in agreement that a formal supply chain strategy will be crucial for both manufacturing and service industries (Kathawala, Yunnus & Abdou,

2003). This vagueness indicates that it is necessary to investigate the SCM phenomenon in greater detail to clearly define the term and concept, to determine those factors that make for more effective SCM, and to recommend how the adoption of an SCM approach can impact corporate strategies, plans, operations and performance.

2.3 Supply Chain Management (SCM) Concept

The American Production and Inventory Control Society (APICS, 2008) describes the supply chain as the connecting of processes across supplier-user industries, starting from the raw materials and ending with the consumption of the finished products. The supply chain comprises all the internal and external functions of an industry which enable the value chain to produce items and supply services to growers (Inman & Hubler, 1992). Some researchers have proposed the inclusion of an information system for the monitoring of all the activities in order to obtain a clearer definition of SCM (Lee & Gilleard, 2002; Morgan, Kaleka & Katsikeas, 2004; Talluri & Srinivas, 2002). The Council of SCM Professionals (CSCMP), which is the leading organization for supply chain practitioners, researchers, and academicians, recently came up with a definition for SCM as the planning and management of all activities related to sourcing and procurement, conversion, and logistics management. What is most significant about this definition is that it also covers coordination and collaboration with supply chain partners who might be integrators, intermediaries, third party service providers, and growers. Ballou, (2007) stated that the SCM essentially combines supply and demand management within and across companies. Scott and Westbrook (1991) defined SCM as the chain connecting each component of the manufacturing and supply process, beginning from the

raw materials and ending with the supply to the end user. This management philosophy concentrates on how businesses make use of their supply processes, technology, information, and skills to improve their competitive edge (Farley, 1977) and the coordination of the manufacturing, materials, logistics, distribution and transportation functions within an organization (Lee & Billington, 1994). SCM is an integrative philosophy to handle the overall movement of a distribution route from the supplier to the end user (Cooper *et al.,* 1997).

The supply chain is defined as all the activities concerned with the delivery of a product to the grower beginning with the raw materials, including sourcing for the raw materials and parts, manufacturing and assembling, warehousing and inventory tracking, entering and managing orders, distributing across all networks, delivering to the grower, and the information systems that are required to keep track of all these activities. The SCM synchronizes and combines all these activities into a smooth process, linking all the stakeholders, including the parties within an organization and the external partners such as the suppliers, transporters, third party companies, and information system providers, in the chain (Lummus *et al.,* 2003). The SCM has also been described as the methodical and strategic management of conventional business roles and the procedures across these business roles within a specific organization and across businesses within the supply chain in order to improve the long-term performance of the individual organization and of the supply chain as a whole (Mentzer, DeWitt, Keebler, Soonhoong, 2001).

Recent SCM studies have mainly focused on the purchasing function as a basic strategic business process rather than a specialized supporting function (Wisner & Tan, 2000). This management philosophy extended conventional activities within businesses by

adopting an inter-business dimension, allowing business partners to come together with the common aim of achieving optimization and efficiency (Harwick, 1997). The definition of SCM has been adapted for the service industry as the ability of the firm / business to get closer to the grower by improving its supply chain networks. The supply chain for services will comprise responsiveness, effectiveness, efficiency, and control (Kathawala *et al.,* 2003). The growers themselves are one of the major suppliers of process inputs in service organizations, and this concept of the growers being the suppliers is known as 'customer-supplier duality.' This duality suggests that service supply chains are bi-directional in nature (Sampson & Scott, 2000). According to Habib (2010e), the concept can also be applied to the academia. Integrated SCM is about moving from the external customer to handle all the necessary processes in order to provide the customer with value horizontally (Monczka & Morgan, 1997). The SCM is usually made up of a combination of functions from the raw materials to the final products. It also includes the combined management of every organization throughout the whole chain (Horvath & Laura, 2001). An examination of the SCM for manufacturing reveals the combined processes that are needed for managing goods from the initial source of supply to the point of consumption. It also comprises a broad range of activities that material and service suppliers, manufacturers, wholesalers, and retailers have been carrying out for years. Individual supply chain participants are able to improve the performance of their own businesses. Very little attention has been given to the advantages of managing the total supply chain process on a combined basis (Closs, 1995). SCM is defined differently for manufacturing. In fact, there are so many definitions of SCM so much so that the important people in the same organization are not

meaning the same things when it comes to discussions on the SCM concept (Monczka & Morgan, 1997).

Firstly, there are definitions which are marked by the most basic concepts of SCM. One such definition is "the ability to get closer to the customer" (Weil, 1998). Another definition states that the supply chain is the movement of information and material from suppliers to customers (Crom, 1996). A company's supply chain, be it internal or external, is a resource that can be used to gain a better market position and to enhance a company's competitive edge. In order to use this resource strategically, companies must take the following steps (Monczka & Morgan, 1997):

1. Get a better understanding of the needs of their customers and future customers, both domestically and internationally;

2. Understand the principal competencies of their suppliers in fulfilling customer needs;

3. Detect redundancies and inefficiencies within the supply chain with regard to current and future competitive needs;

4. Build relationships and partnerships with suppliers who have key capabilities that reinforce, complement, and boost internal core competencies domestically and internationally.

From a manufacturing point of view, SCM can be defined as taking charge of all goods and materials within the supply chain, regardless of how it is handled or managed (Sandelands, 1994). Essentially, SCM is the efficient management of the movement of materials and finished products from the retailers to the customers through the use of

manufacturing facilities and warehouses as prospective intermediaries (Sengupta & Turnbull, 1996).

Supply chain management (SCM) has been extensively investigated in several application areas over the last ten years. Even though SCM research and its applications are widely accepted, there still exists significant uncertainty with regard to its meaning. Researchers and professionals have made several attempts to correctly define SCM. In the midst of intense competition in all industries, SCM has slowly been accepted as an established method of management for achieving viable profitability and growth. This is achieved largely by depending on the whole SCM process to deliver the right products or services, in the right quantity, to the right place, at the right time and with the maximum benefits.

A review was conducted of all the past researches on the supply chain. According to Ballou (1978), prior to the 1950s, logistics was considered in military terms and had to do with the procurement, maintenance, and transportation of military services, supplies and personnel. At the same time, according to Heskett, Glaskowsky, Jr and Ivie (1973), the study and practice of physical distribution and logistics appeared in the 1960s and 1970s. According to Ballou, Gilbert and Mukherjee (2000), the logistics period before 1950 when logistics was not viewed as a strategic function was called the "dormant years". At some point in the 1950s, changes took place that could be classified as the first "transformation". Heskett *et al.,* (1973) suggested that logistics became increasingly important when the management of physical distribution in the manufacturing business was seen as a separate organizational function. The SCM concept was conceived by logistics consultants in the early 1980s (Oliver & Webber, 1992). The authors stressed

that the supply chain must have been perceived as a single entity and that key decision-making at the top level was necessary in order to manage the chain in their original design. According to Gripsrud, Jehre and Perrson (2006), logisticians as well as channel theorists in marketing share the same opinion.

Since its inception in the early 1980s (Oliver & Webber, 1992), SCM has become one of the most generally accepted management concepts (La-Londe & Bernard, 1997). Articles on SCM or SCM-related topics appeared in several journals on manufacturing, distribution, marketing, customer management, transportation, integration and many more. SCM continued to evolve into the 1990s because of the fierce competition internationally. Kannan, Vijay and Tan (1998), came up with a definition for SCM in the electronics industry. Meanwhile, Drucker (1998) went to the extent of claiming that there was a paradigm shift within the management literature: "One of the most significant changes in the paradigm of modern business management is that individual businesses no longer compete as solely autonomous entities, but rather as supply chains. Business management has entered the era of inter-network competition and the ultimate success of a single business will depend on the management's ability to integrate the company's intricate network of business relationships." Fernie, John and Rees (1995) investigated the use SCM in the National Health Service, and in fact, it was the first paper to be written on the SCM in the service industry. Sampson and Scott (2000) examined the customer-supplier duality in service organizations relating to SCM in the service industry. Kathawala *et al.*, (2003) explored supply chain applications in the service industry. Furthermore, in their study, which was based on a survey among employers and students, O'Brien, Elaine and Kenneth (1996) came up with an educational supply chain

as a tool for strategic planning in post-secondary education. The results of the survey revealed that integration and coordination should be encouraged among students and employers. Cigolini, Cozzi and Perona (2004) examined a framework for SCM based on several service industries including automobiles, groceries, computers, book publishing and many more. In a case study carried out at the City University of Hong Kong, Lau and Antonio (2007) identified the educational supply chain as the 'Student' and the 'Research' supply chain. The study by Habib and Mamun (2009a) was the first large scale empirical study to systematically investigate the input and output of the university through an educational SCM. Through this exploratory research model, Habib and Jungthirapanich (2010a) dealt with the education supply chain, the research supply chain and educational management as major elements in an Integrated Tertiary Educational Supply Chain Management (ITESCM) model. According to Habib and Mamun (2011) its applicability was successfully confirmed and corroborated through survey data from leading tertiary educational institutions throughout the world. The emergence and evolution of SCM may be depicted as a timeline as shown in Figure 2.1 below.

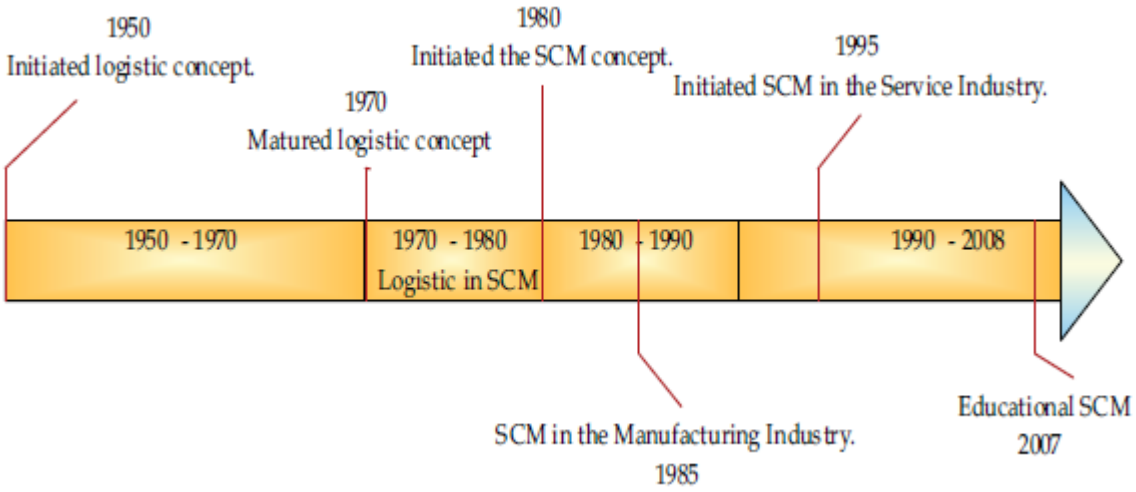

Figure: 2.1
Emergence and Evolution of SCM
Source: Habib and Jungthirapanich, 2008

2.4 Supply Chain in the Poultry Industry

In the poultry industry, the main company within the supply chain framework is known as an integrator. This integrator has a vertically integrated supply chain, being the owner of most of the breeding, feeding, slaughtering and processing facilities (see Figure 2.2). It makes use of the latest technology and maintains stringent hygienic standards in all its processes. It operates together with various distribution networks, from supermarkets to distributors and grocery stores. Its products are also delivered directly to eateries. The integrator is confident that its advantageous position in the domestic and foreign markets is due to the combined efforts of the whole team over a long period of time together with the strategy of the company in providing services and customised products.

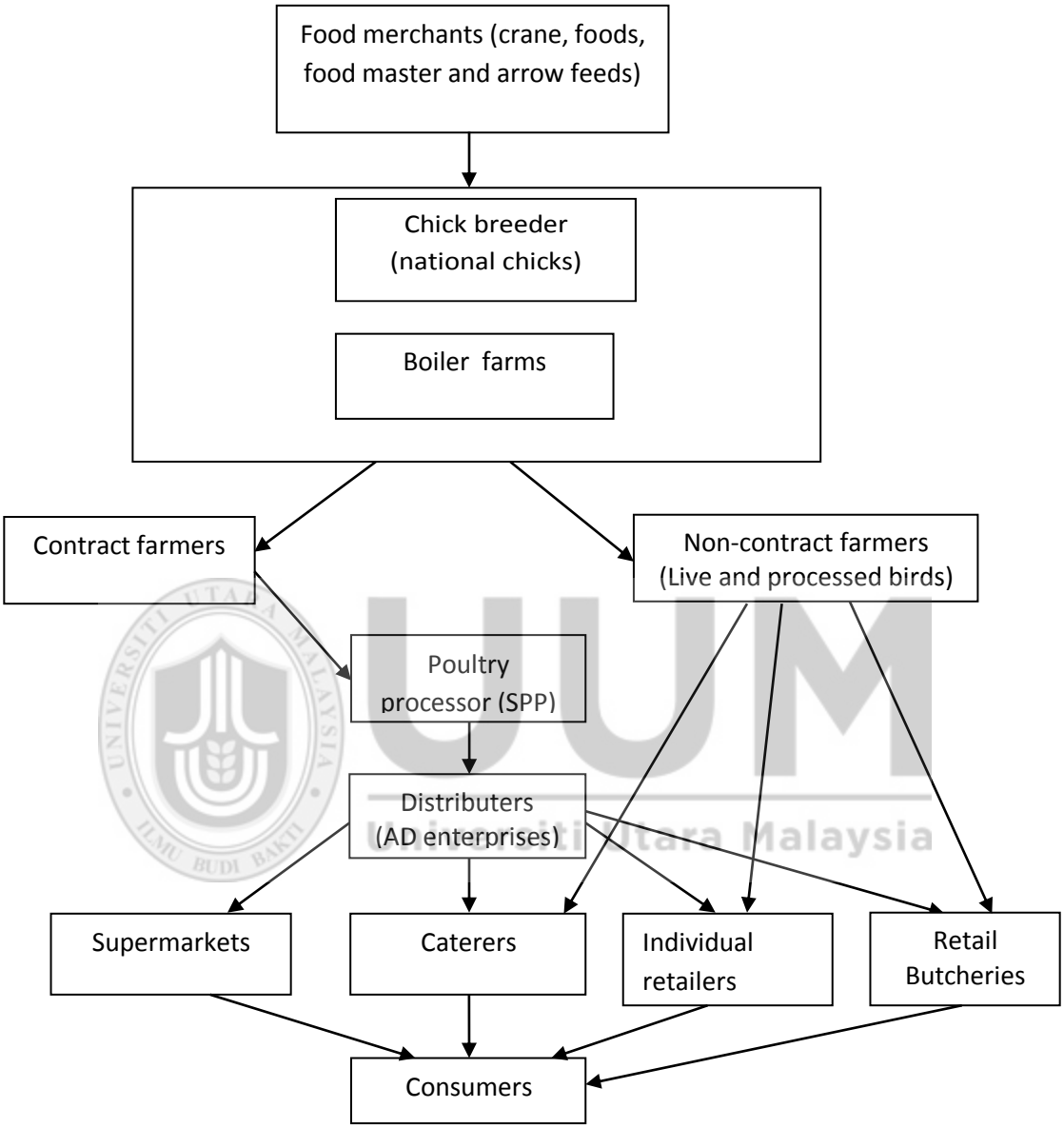

Figure: 2.2
The Broiler Production Supply Chain
Source: Micah B. Masuku, Asian Journal of Agricultural Sciences 3(6): 492-499, 201, p.498

A vertical production chain is made up of a single company managing every aspect of each stage of production. Thus, hatcheries, farms, feed companies, processing plants,

distribution channels, and markets can all be integrated into a single corresponding supply system. In response to unstable conditions in both export and local markets, many producers are transferring their production even more into these types of vertical systems. Furthermore, most of the market is under the control of a few large businesses, and this can pose a danger to the poultry industry.

Challenges for poultry supply chain

Despite the accomplishments of the past hundred years, challenges still exist when it comes to food production and supply chain management. Perhaps the most substantial challenge being faced is the need to feed approximately 9 to 9.6 billion people by the year 2050 (Anon, 2002; Beddington, 2011). The rising demands for animal proteins in developing countries and increasing prosperity in Asia indicate that by 2050 the world will need to double its food production. DEFRA (2010) made a more optimistic evaluation, suggesting that there will need to be a 70% increase in food production, based on enhanced post-harvest efficiency and changing assumptions of the Food Agriculture Organisation of the United Nations (FAO).

All the same, the differences in the projected food requirements, it can be confidently said that the increased production will not be met by increasing the land area. It should be noted that land will be swallowed up urban spread out disorderly salineness to become a desert and the rise in sea levels (Beddington, 2011). For example, approximately 21% of the farming land in the fertile San Joaquin Valley in California has been taken over by housing since the peak in land availability in 1986 (Anon, 2011a). There are also challenges with regard to the supply of water, energy, phosphorus and potassium for food

production. The increase in food production will largely need to be propelled by the adoption of new technologies.

Under such conditions, the challenge will be to provide a sustainable combination of agricultural practices to provide the food, fibre and fuel required by the world's population. May be the most crucial challenge will be firstly to identify what is sustainable. According to Beddington (2011) 'more food must be produced sustainably through the spread and implementation of existing knowledge, technology and best practices, and by investment in new science and innovation and the social infrastructure that enables food producers to benefit from all of these'.

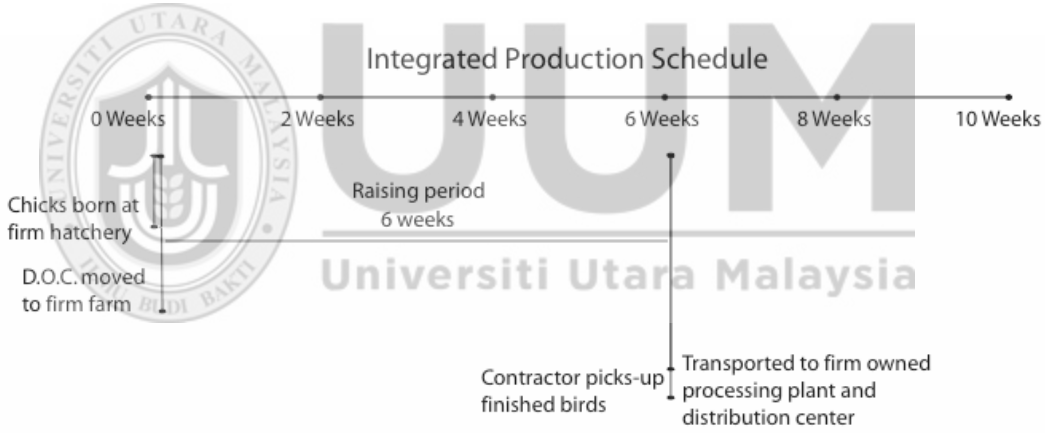

Figure: 2.3
Example of a Production Schedule for a Vertically-Integrated Production System
Source: DVS, 2013

2.5 Contract Farming

The activities of companies, businesses, industries and countries as a whole are interrelated and closely related to some extent. The ways and the degree of strength the relationships have been changing and evolving from a historical perspective. These

relations, which are conceptualized as institutional and technological, are closely related to the intended aims, the socio-economic structure of the partners, etc. Currently, there is a fast-growing integration among firms, industries and countries for different purposes, such as political and mainly economic reasons. When integration is carried out among firms in an industry, vertical integration is given importance and consideration. It has been recently argued by many that agriculture is going through a process of vertical integration with related industries, and that ultimately, the industry itself may lose its grip on agriculture in the future (Trifon, 1959). There will be a greater dependence on vertical coordination, and contract production and producers will not be as independent as today's farmer (Harryman, 1994).

For a preliminary understanding, contract farming resembles a future contract of sorts between the producers (growers) and integrator (buyers of the products), often under the direction of the business, which stipulates the quantity and quality of the produce, and also, in some cases, providing the means of production as well (Singh, 2008). There are a number of definitions of the term to help in an understanding of how the system works and the type of responsibilities that are shared by the two parties; the grower has to maintain the broiler farm that is on his land, and ensure that he harvests and delivers a certain amount of produce, while an integrator is responsible for providing the grower with the essential equipment and inputs.

The normal, standard contract between the grower and the integrator will have the following provisions, the fundamental terms of which may vary in intensity and scope: (a) *Market provision:* The grower and the buyer agree on terms and conditions for the future sale and purchase of a livestock product (b) *Resource provision:* In line with the

marketing arrangements, the integrator agrees to provide certain inputs, including, at times, land preparation and technical advice, and (c) *Management specifications:* The grower agrees to abide by proposed production methods, input regimes, cultivation and harvesting specifications (Bijman, 2008).

Primitive agriculture itself was a fully integrated system. As suggested by Penn (1958), vertical integration is almost total in existence agriculture as most of the production resources and decisions are controlled by the same persons. The seeds would be collected and female pig, the crops would be harvested, and the animals would be reared and fattened by one family, who would also be the consumers of the produce after reserving seed or breeding stock for the coming year. The switch from subsistence farming to the current market-oriented agricultural system has been marked by a progressive breakdown of functions, with specialization being one of the distinctive features of the present commercialized agriculture.

As a production industry, agriculture is closely linked to marketing activities which to change, convey and shift the consumer. In addition, agriculture is serviced by many industries which are supplying inputs to farms. Thus, coordination or integration between farms and the other firms in the industry, both forward and backward, is now unavoidable. In advanced agriculture, however, there are now strong indications that the tendency is towards integration. The main reasons for this disadvantage are, of course, changes in market structure (born of supermarket revaluation) and the improvement of high technology in farming (Barker, 1972).

Integration means combining two or more parts together. There are three basic types of integration. Vertical integration takes place when a secure business combines activities

that are unlike those that it currently performs and which are connected to it in the chain of marketing and production activities. One example of this form of integration is the doing meat packing who decides to reach both backward towards the producer to purchase the livestock direct from the farms and forward towards the consumer to manage his own meat wholesaling firm. Horizontal integration takes place when a firm takes control of those firms which are conducting similar activities at the same level in the production and marketing chain, for instance, local dairy cooperatives which are controlled by a regional cooperative. It is best to confine vertical integration to ownership integration, whereby two or more stages in the production and marketing processes are efficiently controlled by one management. This term has more to do with a technological, rather than an institutional, development.

Companies often grow both vertically and horizontally. Circular integration occurs when both vertical and horizontal operations are bound together. When dairy farmers are organized together in a dairy cooperative, a vertical integration emerges. At the same time, if the dairy cooperatives are organized under a regional cooperative union, a horizontal integration has taken place. A different type of organizational expansion takes place when agencies or activities that are not directly related in any way to each other are brought together under a single management. Another way to assess the integration that has taken place in one industry is to study the degree to which the decisions and the ownership of the companies' assets are transferred. When all the decisions and assets of the firms are brought under the control of a single firm, the ownership is known as an ownership integration or merger. On the other hand, contract integration occurs when

each firm keeps its individual identity but leaves one or more of the production and/or marketing decisions to another firm.

However, according to Cramer and Jensen (1988), Paarberg (1995), the terms vertical coordination, vertical integration and contract production are frequently used interchangeably. Obviously, vertical coordination is quite a broad term which embraces all the ways of synchronizing vertically interdependent production and marketing activities varying from spot markets through different types of contracts to total integration (Frank & Henderson, 1992). Four types of vertical coordination between farmers and off-farm businesses are generally identified in agriculture.

i. Coordination without any contract: This is called a spot market or open market transaction. In this relationship, no written or oral contract for both buying and selling exists between the integrator and the grower. The grower purchases supplies from whomever he chooses and sells his products to whoever offers him the best price. Although this type of integration does provide the grower with the liberty to buy and sell as he pleases, yet a major weakness is that the grower is subject to uncertainties with regard to the buying of supplies and the selling of his produce.

Contract Farming: This is sometimes known as resembling or having a likeness. The British and Americans have a different approach to this subject. The British view make a sharp distinction between contract farming and vertical integration, and they see one as a substitute for the other (Barker, 1972). Allen (1972) prefers to confine the meaning of vertical integration to what is known as "ownership integration." The Americans especially tend to view contract farming as a form of vertical integration.

Ownership Integration: In this form of integration, each farm loses its prominent identity and comes under the control of a company which owns or leases the land, buildings and equipment and has its own staff.

Farmer Cooperatives: An agricultural cooperative is an organization that is often incorporated, owned and controlled by agricultural producers, and functions for the common benefit of its members as producers or benefactors (Rehber, 1984). A cooperative organization is one example of vertical coordination on a worldwide scale.

According to Watts (1994), these types of vertically coordinated production relations are nothing new, since contracts were used by the Japanese colonial states for sugar production in Taiwan in the years after 1885 and by the USA for banana companies in central America in the early twentieth century. However, by the late 1900s, contract farming became an essential part of the food and fibre industry across much of Western Europe (with the earliest record of a forward purchase agreement being in 1878), North America and Japan (Barker, 1972). In the developed capitalist countries, contract farming appears to have been widely used by the vegetable canning industry in North America and by the seed industry in Western Europe in the 1930s and 1940s.

In a general and partial sense, contracts are found in agriculture everywhere in very diverse forms. Simple market specification contracts or future purchase agreements, which are normally used for determining the price, quantity and time of delivery are common, and labour contracts for the supply of workers and machinery are used on a wide scale in agriculture (Wright, 1989). Contract farming or contract production, however, must be differentiated from the range of simple marketing contracts. Contract farming in particular involves relations between growers and a private or state enterprise

that is an alternative for spot market transactions between family farms and a processing, export or purchasing firm. Prices, production practices, product quality and credit facilities, etc. are regulated in advance by a typical farming contract.

It is quite difficult to come up with a meaningful definition of contract farming. The standard definition often given by scholars is that of a contractual arrangement, whether oral or written, between a grower and another company, stipulating one or more conditions relating to the production and/or marketing of an agricultural product (Roy, 1963). This is probably too broad a definition since it would include a forward contract in which only price and volume are fixed. Forward contracts that can be bought and sold are not the focus here. Glover (1984) suggested the addition of two conditions if the above definition is to exclude marketing arrangements such as forward contracts. Firstly, the contract should be non-transferable, and secondly, the term "and/or" should be replaced by "and". In other words, the contract must stipulate one or more conditions relating to production and marketing.

Contract farming has been advocated over the past thirty years as an established innovation to improve agricultural performance in less developed countries and it has sometimes been touted as a major element of rural development and/or settlement projects (Ghee & Dorall, 1992). This system has been accepted and is being used as one of the likely institutional structures for the delivery of price incentives, technology and other agricultural inputs. According to Glover (1994), local governments, private local firms, multinational companies, some international aid and lending agencies like the U.S. Agency for International Development, the World Bank, Asian Development Bank, and

Commonwealth Development Corporation, have been involved in these contract farming schemes.

However, Glover and Teck Ghee (1992) stated that in practice, worldwide applications of contract farming have resulted in the emergence of different terms and meanings with regard to contract farming in the related literature. Hence, contract farming is used to refer to only private sector schemes, while other terms are used to denote different applications as follows – An Outgrower Scheme is generally used to denote a government scheme. In this scheme, the government usually has a public enterprise that purchases produce from growers on its own or as part of a joint venture with a private company. This term is commonly used in Africa and Asia. A Nucleus-Outgrower Scheme is a variation of the outgrower scheme in which a project authority owns or manages a plantation next to the processing plant. This plant complements its own plantation production by contracting in different proportions. Satellite Farming refers to any variations of the abovementioned schemes. On the other hand, the term 'multipartite arrangement' is used to highlight a scheme in which several factors such as private firms, government and foreign aid agencies are involved.

Several types of contracts are differentiated with regard to the number of decisions influenced, sharing of the risks and specifications of the contract terms. Two types of contracts are defined according to the viewpoint of the production decision or management.

Limited Management Contracts: Here, the farmer signs a contract to obtain the supply of certain production inputs. The prices are not guaranteed and the farmer's responsibility is confined to the production inputs that he is entitled to under the agreement.

Full Management Contracts: In this case, the farmer and the integrator firm have entered into a contract based on a certain amount of production. In this type of contract, the farmer has to follow some provisions specified in the agreement. In this way, the producer provides a certain market for his product and insures himself against risks (Kohls & Uhl, 1985).

Market Specification Contracts: These simply specify some of the product quality measures which will be acceptable to the integrator and also places some regulations on the price and the method of payment. Contracts are generally signed at planting time and specify how much the integrator will buy and at what price. Little or none of the farmer's management decisions are conveyed. From the producer's perspective, they are guaranteed of a buyer if they meet the specifications.

Resource Providing Contracts: In this type of contract, the integrators supply production resources under certain conditions and provide managerial assistance and supervision. The prices of the products are usually determined by the spot markets and producers have very little guarantee of income.

Management and Income Guaranteeing Contracts: These types of contracts often include the production and marketing specifications of the former two types. In addition, in this type of contract, market and price risks are shifted from the farmers to the integrator. In return, the integrator assumes a large part of the managerial responsibility of the farmers.

A fair contract should include mutual obligations with a balance between the rewards and the risks ensuing to each party. A production contract should at least contain the provisions as presented below.

The amount of the produce should be stated. The contracts can be signed based on the acreage or tonnage. Processors bear the yield risk if the contract is signed on an acreage basis, while farmers bear the yield risk for the tonnage basis. The responsibilities of both parties concerning the production and marketing practices must be clearly stated, and the manner as well as the timing of delivery or collection must be indicated.

The price (specific or formula) or other considerations must be determined and the effects of variations in quality, quantity or manner of delivery must be indicated. In addition, the manner and timing of payment must be stipulated. The price is often left as a variable in contracts. One or three-year contracts usually use fixed or negotiated prices. If most of the commodity transactions are priced through such negotiations, the fixed price becomes the market price. Sometimes contract prices are determined by a scale or formula that relates the contract price to various economic indicators (Buccola & French, 1981).

Buccola (1980) suggested that the period of the contract and the way in which it may be terminated and/or renewed should be stated. Contracts for the processing of vegetables and field crops are usually made for a year, while fruit contracts are usually for more than a year. Either an arbitrator should be appointed or it should be stipulated how disputes are to be settled. An assignment should be provided for the contract.

An agricultural production and marketing system is made up of different stages or sectors comprising the suppliers of inputs, the farm operator, the processor of farm products, the distributor and the end user. In the West, the relationships and dealings between these sectors are achieved in various ways. Allen (1972) proposed: a spot market or a conventional free marketing system, which still accounts for a greater share of the present world marketing system; complete vertical integration, as in ownership integration or

agricultural cooperatives and producer groups (e.g., marketing and processing cooperatives, marketing boards and other producer associations); and vertical coordination and contractual relationships.

The first conventional form of market organization and price determination will continue to be the best way to coordinate the links in the system if certain conditions prevail, such as if production takes place near to the points of final consumption, and there is some form of control over short-term changes in prices and sales, either through the government or producer organizations. Hence, the purchaser or government is able to accept some sort of vague grading, and producer groups can set grading standards with adequate and possibly ever increasing accuracy according to changing market requirements. Furthermore, agricultural extension and advisory services provided by the government must be comprehensive and efficient.

In a competitive open or free market system, the market mechanism is controlled behind the scenes by pricing. The impact of the price would be passed back to the processor through the final supply points (supermarkets or grocery stores) then to the farmer, and finally to the supplier of the inputs. However, this system moves at a slow pace, and it can be changed by a centralized decision-making mechanism that is not under a collectivist system, but that is managed by the private sector via group action, such as cooperatives, or by vertical integration, changing from contract farming to ownership integration. As suggested by Paarlberg (1995), this contract/integration system has been defined as being the most insightful. Organizing under an agricultural cooperative or producers' group can also be said to be a type of ownership integration. Sometimes the relationship between the cooperatives or groups and their members is more of a

constitutive, rather than a contractual, relationship. It can impose obligations in respect to production methods, product specifications, the timing of delivery and so on. Even if it is subject to dispute to some extent and needs rather detailed investigations, some empirical evidence shows that contract production between farmers and their own cooperative processing company has very real consequences. This was observed in the USA and Turkey. In the U.S. sugar industry, a grower-owned processing cooperative appeared in the 1970s (Koening, 1995). In Turkey, during the privatization period of the 1980s, some of the sugar industry companies turned to grower-owned ones, which formerly had been a kind of state enterprise (Rehber, 1997). The primary motivation behind such arrangements was to gain greater control over the physical characteristics and quantities of the commodities that were being exchanged and to reduce the economic terms of trade (Buccola & French, 1981).

Changes in the market structure are another major significant force behind integration and contract farming. The main reasons for this are the presence of professional buyers in the market, and the need to supply produce of a certain quality and quantity at a certain time. It is a fact that production technologies have been improving at a very fast pace. Contract farming is seen as a reliable way to encourage the innovation of new technologies and to ensure more efficient production. A huge investment is required to set up a processing plant and such an establishment would incur high fixed costs. A disproportionate supply of raw materials greatly increases unit costs. Therefore, these firms are interested in maintaining a steady supply of raw materials to meet the plants' capacity. The firms will probably not be able to obtain this steady supply of raw materials if they were to depend on open market purchases. Contract farming is also perceived as a

way to commercialize and industrialize agriculture. Contract farming will benefit the small family farms and farm workers who need assistance in the form of capital and management (Moore, 1994). In short, from the general or industry viewpoint, some of the reasons for contracting according to Roy (1963) and Harryman (1994) include the guaranteed supply of the required raw materials in a timely manner, the securing of products at stipulated standards of quality, the introduction (expansion) of new technologies to producers, the changing or enhancement of the management skills of the producer, the reduction in the overall risks to the firm with contracts compared to ownership integration, control over the costs, and the gaining and strengthening of the market position.

The benefits of contract farming from the producer's perspective can also be summarized as follows (Doye, Berry, Green, & Norris, 1992). Most of the farms are small and real being. It is common knowledge that small family farms have the potential for growth in agricultural production and there are certain socio-economic benefits to small scale agriculture (Rehber, 1996). However, there are serious limitations to small farm production when it comes to access to production inputs, services and information. Small farmers often do not have the necessary production and marketing information, particularly about new crops and varieties. Even if they do have adequate information, they lack the financial resources and often their credit facilities are limited mainly because they don't have enough collateral. This structure needs to investigate institutional mechanisms. Contract farming is an example of one such mechanism that has an integrated approach towards many of these limitations. Government intervention and subsidies can be viewed as alternatives to contract farming, but in the developing

countries particularly, public interventions and support policies are ineffective and have failed to remove the abovementioned hurdles. The government's efforts at offering subsidies have also mostly benefitted the owners of large farms. At this point, the "New World Order", which is comprised of the global restructuring of the food industry as put forward by the GATT and the newly established WTO, and which is mainly aimed at reducing or removing agricultural subsidies, must be taken into consideration. Besides the reasons mentioned above, the recent introduction of advanced innovations, such as environmentally sound, sustainable and economically viable agriculture, are the main initiatives behind the fast growth of contractual arrangements.

In general, together with a host of related problems, such as delays in delivery or payment, poor quality, etc., which are emerging from the applications, contract farming also has some disadvantages or issues as a production system. One of the economic factors that favour the increasing use of production contracts is the need to achieve efficiencies through risk management. However, contract farming creates risks of its own, despite reducing the risks of others.

i. For the producer, the failure to produce according to contract standards will result in the loss of the contract's premium prices. Other risks would include the non-renewal or termination of the contract, perhaps for reasons other than economic reasons. The main risks for the processor are the failure to line up supply, or losing the timely supply of the desired quality and quantity of the product, loss of technological benefits, and liability to the producers and to third parties (Kelley 1994).

ii. To a certain extent, the farmer loses his independence, depending on the conditions of the contract, as the farmer's management function is shifted onto someone.

It is doubtful that a skilled farmer may be worse off under a contract compared to taking his chances in the open market.

iii. It is a fact that contracting is an unequally matched dialogue between an economically powerful agri-business and much weaker farmers. But farmers can work together to gain bargaining power so as to ensure fair contract terms. For instance, in the USA, agricultural bargaining cooperatives have become an essential part of the marketing system of certain agricultural products (Marcus & Frederick, 1994). By the early 1960s, more than 325 cooperative bargaining associations were participating in contract negotiations. By joining forces in their cooperatives, the farmer-members can have better control of their own economic future (Ling, Charles, & Liebrand, 1995). If the integrator has gained a monopsony, he could misuse his own position to make the contract provisions work in his favour. That means that when alternative marketing opportunities are shut out, an extremely integrated firm or sector may violate the terms of the contract. Naturally, this is not a desirable outcome in improving agricultural marketing.

When evaluating the success and failure of contract farming applications and their outcomes, contractual arrangements might be summed up into two broad categories as private contract arrangements and out grower schemes. The first one is mainly used by the developed world while the latter is used in the less developed and developing countries. Of course, there are some important differences in the details.

Firstly, the origin of contract farming varies. One of the ideas behind contract farming for the developed and developing countries to some extent is to ensure a steady supply of raw materials at a certain standard of quality to the marketing or processing industry. According to Watts (1994), in the less-developed world, it was implemented to

complement and occasionally, to compete with, and to partially replace plantation and estate agriculture or to include independent farmers and sometimes newly-settled families under state or private protection to produce a variety of products for domestic consumption and export (Watts 1994). Therefore, contractual relationships have been appearing as outgrower of schemes in developing and less developed countries, while in the developed world, it was in the form of private agreements mainly between an individual or a group of farmers and private companies. Hence, Glover (1987) stated that while the aims and the structure of contract farming are almost similar and rather definite in the private contract farming system, the outgrower schemes have a hybrid structure and multiple objectives. The reviewed literature reflects the tremendous variety of contracting schemes in Africa and Asia regarding both the contracted parties, the social organization of the schemes and the diversity of the contract itself.

In practice, the success or failure of contract farming a point in time on the nature of the crops and the technology in use for their production. For example, basic hardy grains that do not require strict quality standards or speedy harvesting and processing have generally no need of contractual arrangements (Andrews, Hamilton, & Looney, 1994). On the other hand, the perishability and large size of some products require focused production and careful scheduling, and usually require contractual relationships. Contract farming is quite effective for those commodities for which the supplies of both inputs and outputs are rigid and shifting, and which incur high costs, such as broiler production.

On the other hand, contract farming has a great variety of structures. The form it takes and the attitudes and background of the growers are affected mainly by the availability of other alternatives and the peculiarities of the political, economic, and social

circumstances at the local and national levels, along with the specialization of the product (Minot, 1993). Therefore, the use of contract farming as a way of increasing agricultural productivity, improving marketing and fostering rural development cannot be assessed independently of the factors mentioned above. Thus, it can be said that the reasons behind the success or failure of contract farming in the developed, developing and less developed countries are very different and are dependent on the related infrastructure (Carney, Little & Watts, 1994).

In the developed world, a sophisticated market structure, high technology level, farming structure, and the attitudes of governments create a rather suitable environment for private contracting arrangements depending on the product features. The use of production contracts is increasing in the developed world. For instance, between 1980 and 1990, the percentage of pigs produced under contract increased from 2% to 18% in the U.S. In 1990, contract production accounted for 7% of the production of food and grains and 12% of the production of cotton. In those sectors where contract production has been introduced, more than 90% of broilers and 80% of processed vegetables are produced under contracts (Kelley, 1994). It can be seen that in the U.S. the broiler industry is almost entirely vertically coordinated as in almost all of the developed countries (Vulkina & Foster, 1996). In the U.S., a large percentage of the increase in vertical coordination in the swine industry is due to contract production. A variety of contractual arrangements are available through feed companies, integrators, genetic firms and packers. However, little is known about the profitability and risk characteristics of these alternatives. One of the researches on this subject suggests that risk neutral producers in the Midwest would prefer independent production while risk averse

producers would prefer to choose among the various types of coordination arrangements (Johnson & Foster, 1994; Rhodes & Grimes, 1993). For example, in the other developed countries, broiler integration was 23% in the Korean Republic as compared to 75% in Japan in 1989 (Yi, Sugiyama & Oguri, 1993).

In the European Union, contract farming has been boosted by the production aid system. This approach, of course, plays a considerable role in the development of contract farming in the Union. For instance, one of the observed changes in the Spanish food industry after Spain joined the EU has been the increase in contractual arrangements. In Spain, the number of farmers involved in contract farming increased from only 28,000 in 1986 to 77,000 in 1988 (Erkan, Akdemir & Koc, 1993). When the contribution of vertical integration and contract farming to German agriculture was analysed, it was concluded that these approaches can result in substantial advantages for cooperating farmers but do not automatically improve the competitive position of the parties involved (Zurek, 1993). In Germany, vertical integration through contract production is already widespread in the dairy, poultry and sugar sectors, constituting around 38% of agricultural production. Outside these sectors, however, only about 6% of output is produced under contract. This type of integration benefits both sides and is likely to continue (Gross, 1994). A study based on data of the Agricultural Census of Italy shows that contract arrangements are closely associated with farming in the entire region and reflect the state and conditions of agricultural development in each of them. This suggests that contract farming is a continually evolving process, which also ensures that agricultural development is linked to overall development and affects the forms that contract farming takes in different areas (Pecci & Lipparini, 1993).

In the improved feed sector, the increase in contract farming has rapidly narrowed the genetic base of Western agriculture, which has accompanied the advancement and widespread use of new crop varieties (Burch & Rickson, 1990). Biotechnology companies are also expected to develop vertical integration by responding to specialty markets and getting involved in contract farming (Shimoda, 1994). Contract farming is being presented as a means for the transfer of technology, the transformation of peasant smallholders, and the formation of a secure and politically conservative class of family farmers. On the whole, contract farming is widespread enough in the region to be regarded as a significant path to the growth of capitalism in agriculture (Clapp, Little & Watts, 1994). Watts (1992) reiterated that contract farming signifies a growing and widely promoted method of agro-industrial integration for developing economies and is portrayed as a method by which agriculture in the developing world is gradually coming together with that in the developed world.

In the developing world, the available infrastructure needs intensive government involvement as well as the financial support of domestic and foreign donor agencies and the initiatives of national and multinational companies. In the recent two decades, there has been a tendency for transnational corporations to shift from land ownership to a contracting system. This system of coordination looks promising for rural development if it can be easily incorporated into the economy of a country. In such a structure, agricultural policies which are shaped by public institutions, both at the level of national governments and international organizations, are shrinking in importance and are in the process of being replaced by unregulated, transnational market forces (Nanda, 1995). There is a possibility of exploitation as an unorganized mass of smallholders faces a

single buyer. In the years following World War II, contract farming has been replacing several different types of agricultural production in Latin America. In the Honduras, for example, bananas, which were once grown on corporate plantations, are now being cultivated under contract by associate producers. In Peru, breweries that once used to purchase barley on the world market are now receiving their supplies through contracts with a group of farmers.

A study carried out in seven countries in East and Southeast Africa, namely in Kenya, Tanzania, Zambia, Zimbabwe, Lesotho, Swaziland and Malawi with regard to their experience with contract farming and outgrower schemes showed that on the whole, the performance in terms of the delivery of services and the provision of higher incomes to the farmers had been quite positive, although a more extensive application of this type of organization was restricted by the high management costs. Glover (1990) concluded that overhead costs might be lowered and management capacity be developed among growers if there is less control and greater reliance on price incentives and farmer involvement.

The experiences vary in the same sub-regions of the world. For example, the Malaysian schemes appear to be the most successful. According to Glover and Teck Ghee (1992), they are long established and have increased in size and number. The Indonesian schemes are also widespread and active. But the experience of Thailand is quite the opposite. Attempts and efforts have failed in almost every case examined (Manarungsan & Suwangindar, 1992). If the farms are small and there are various production activities, then the farmers and companies both benefit in terms of greater flexibility, increased production, marketing and guaranteed supply options. Of course, failures in the related government policies also have negative impacts on contract farming. Perhaps the main

reason for the success of the Malaysian and Indonesian experiences is the strong and continuous support provided by the government (Ghee & Dorall, 1992).

An analysis of the Kenyan experience has shown that contract farming has the potential to provide a Pareto-improvement form of governance, and it can be used to increase the income that is available to the rural sector. It is a practice which may be engaged in for both efficiency and anti-competitive motives (Gross, 1994). Also, other researches have shown that contract farming within tea production smallholdings in Kenya has changed relations between family members, and the role and stature of women and men in the family (Bulow & Sorensen, 1988).

In Swaziland, the development of outgrower schemes is being promoted through the Fourth National Development Plan following the example of the Vuvulane Irrigated Farms as an alternative option for rural development (Levin, 1988). With reference to tobacco production in Sri Lanka, it has been argued that contract farming can only contribute to meeting basic needs if the income and employment it generates can be distributed with a measure of efficiency (Kirk, 1987). In the rapidly growing economies of Southern Asia, besides the emergence of processing enterprises which meet the diversifying and growing domestic and international demand, the contract farming system is a feature of the rural growth process.

A research study, which was based on case studies of village-level processing and marketing activities involving soybean, cassava and tobacco in Indonesia, illustrates that significant additional income and employment can accrue to farm producers from such agricultural marketing and processing activities at the village level (Kawagoe, Von-Broun & Kenedy, 1994). India is now the second largest producer of fruit and vegetables

in the world. When the facilities to improve this production potential were being discussed, one of the measures suggested was contract farming (Bhatia, 1994).

One of the important reasons behind the failure of contract farming is the availability of other ways of vertical coordination and open market facilities. This is clearly being experienced in the Turkish agriculture industry. In the short journey market, there are three marketing alternatives that growers are faced with (Rehber, 1996). In the first alternative, a private company grows a quantity of raw material on its own plantation while having contractual agreements with the growers. In the second alternative, a private company and the state monopoly are in the market as buyers with a payment-in-advance pricing system only during the harvest season. The third alternative is a farmers' cooperative. In such a system, despite receiving favourable offers, the private company failed to increase the number of contract growers and its market share beyond 60% (Rehber, 1997).

2.5.1 Structure of Contract Farming

Outgrower schemes are popular in the developing world and have shown a great variety in terms of their mixed structure and manifold objectives. Therefore, it is difficult to come up with a standard outgrower scheme. A simplified model of a standard (private company scheme) contract production for a fair and successful implementation of contract farming for both the agricultural and economic sectors as a whole is discussed here (Figure 1).

First of all, both the producer/grower and the integrators (handler, processor, etc.) must have collaboration consciousness. It is important for both the producers and the processor

to be well-known for their honesty and fair dealing. That means farmers should consider the integrators as their partners who are working for them rather than as their competitors, and the same is expected of the integrators. Both parties need each other if they are to benefit mutually from the contractual relationship. Otherwise, this cooperation would always be riddled with arguments and frustrations.

In a contract farming system, the individual producer probably has good reason to feel that he is lacking in market power. However, history has proven that growers have seldom been adequately rewarded in the marketplace because of their weak position as farm entrepreneurs in comparison to other participants in the food industry. For this reason, it is very important for producers to be organized into a group. Organized groups get more attention compared to unorganized farm producers (Anderson 1994). Farmers who are organized into a bargaining cooperative are quite powerful in a contracted relationship (Scheid 1991; Moore 1994). Such an organization could also have the opportunity to collaborate with the integrators' organization. The producers and processors could act in unison. For example, the California Tomato Growers Association needed to play an active role in controlling imports and thus they formed the National Association of Growers and Processors for Fair Trade (Marcus & Frederick, 1994). They then succeeded in enforcing some regulations on imports and on other aspects, such as market development, political action and making adjustments to customer demands.

Of course, these local bargaining organizations must be organized on a national level. However, in practice, the level of negotiations in such organizations is a debatable issue. It can be said that on the whole it might be better if the collaboration and negotiation between farmers and processors are carried out in a decentralized way at the company

level. A national farmer and food industry organization can act as an administrative body. It can retain its role as an arbitrator so as to ensure the application of private agreements. The responsibility for the testing and development of referral and agricultural techniques could continue to rest with the central body. The experience in France has shown that between 1961 and 1990, a considerable shift emerged to reconcile industrial and marketing coordination (Valceschini, 1995).

In contractual agreements, the integrator firm plays a very important role in determining many of the production and marketing practices and procedures. Therefore, the efficiency of contract farming is directly affected by the efficiency of the activities of the firms. The first step towards the successful implementation of contract farming is the organization of a solid group. Contracts could vary from company to company, but all companies must have a special unit to handle all contractual issues and it must be equipped with the necessary personnel and equipment. At the same time, its relationship with the other functions of the firm must be clearly defined (Brown *et al.*, 1994).

The government also plays a very important role in the successful implementation of contract farming. The first function of the state government is probably the legislative structure. With such a wide variety of production firms available in agriculture, it is impossible to come up with all-inclusive contract models which are bound by stringent rules. Instead, the government could decide on a contract framework and pass some regulations to settle disputes and participate in arbitration at some level.

Other than the direct role played by the government in contractual mechanisms, agricultural support and intervention policies, which are generally directed at enhancing contract farming, could be quite effective and practical. For example, the bargaining

power of farmers in the U.S. when it comes to certain products is strengthened by marketing directives. According to the Commission Regulations in the European Union, the production assistance system is based on contracts between the producers and the processors, and the details that are to be included in the contracts for the purpose of the aid system should be spelt out (Anonymous, 1984).

Another aspect that must be taken into consideration in the promotion of contract farming is tax policy. Contract farming is a method of recording systems of production. Farmers are currently hesitant about profiting from contract arrangements as they are afraid that they may have to pay higher taxes. Therefore, a tax policy could be recommended for adoption that would facilitate and resolve the situation. Although specialization, aimed at producing a single product through contract farming, has been increasing profits, it has, at the same time, increased the risks for growers. An agricultural crop insurance policy could be a good way of reducing the risks, both for farmers and firms. Contract farming could be a way to enhance the ineffective extension and training policies of the governments. Credit policies in agriculture could also be attained by contractual agreements that deem the contract itself as collateral.

It is proposed that an independent organization be set up to resolve conflicts between firms and farmers, which are the major reasons for the failure of contract farming. It often takes a long time for the courts to settle disagreements and disputes between producers and processors over issues such as quality standards, delays in delivery, payments and default on loans. Thus, it would be useful to have to make a judgement and/or a conciliation system (Spolter, 1992) that includes the government and representatives of non-governmental organizations.

In arbitration, an arbitrator makes a decision and a third party enforces it by removing all control from the parties. But in conciliation or mediation, the parties remain in control of the procedure and the outcome.

Vertical integration or coordination in agriculture has varied from spot market transactions to ownership integration. One of the methods of vertical integration globally is contract farming. Of course, contract farming will not solve all the issues related to agricultural production and marketing, but it can be seen as an easier way of gaining access to credit, input, information and technology, and product markets for small scale farmers. Contract farming can be evaluated as a form of structural a meeting place between First and Third World agriculture and also as a way of achieving a higher synthesis between agriculture and industry.

Contract farming is an ever-changing process. Applications of contract farming globally have revealed that the terms of the contract are drawn up subject to their own conditions and vary from one product to another. Furthermore, each country has its own unique experiences. Besides the benefits of contract farming to both sides, there are some disadvantages, such as losing some measures that could create problems that would far outweigh the benefits of contract farming. It can be concluded that if contract farming is to be successfully implemented, there must be conscious coordination and collaboration, and organized action on the part of both parties. At the same time, the attitude of the government and the incentives provided by them are also important aspects to be taken into consideration.

In Malaysia, production through contract farming is considered to be a relatively new concept. Furthermore, it has flourished even better in certain areas and there are certain

agricultural produce that are more suitable than others for contract farming. In keeping with this, the research on contract farming tends to be crop-specific and region-specific in its outlook (Tripathi, Singh & Singh, 2005). Although contract farming is mainly understood in the context of agriculture, it can equally be applied to animal husbandry and poultry products.

The aim of this research is to examine the poultry sector in Malaysia and to recognise how contract farming, as a method of sourcing, fits in to be current production and distribution networks in the nation. This forms a good background for the use of Malaysia as a suitable research entity for understanding the situation in the industry, which is an integral part of the poultry sector, and then place 'contract farming' in their context.

The term "contract farming" usually refers to situations in which a farmer rears or grows an agricultural product for a vertically integrated corporation. For example, thousands of farmers throughout the country are growing broilers under contract farming arrangements for big poultry-producing companies. Contract farming arrangements are also becoming common in other kinds of poultry production. To be expected contract farming arrangement involves two parties: the grower and the company (integrator). Generally, the grower provides the land, the buildings, the equipment, and the labour, while the company provides the broilers, the feed, the medicine, and management directions and services. Broiler contracts involve the contracting out at the growing stage. The integrators (i.e. the businesses that control or contract out each stage of production) engage huge farms (growers) to rear broiler chickens for meat according to contractual rules. From the growers' point of view, the contracts with integrators give them access to

many aspects of production that might otherwise be closed to them, including credit, production technology, and the world market. Farming contracts can also assist growers in mitigating the risks due to fluctuations in the prices of inputs, and provide them with a stable market outlet for their products, which is particularly important because of the inadequate facilities available to independent farmers for the rearing and processing of chickens. Although producers are being pushed by current trends toward vertical integration, many farms are still under contract or left with unused infrastructure from previous contracts. These contracts encompass four main elements, namely price, quality, quantity, and time. The first type, procurement contracts, only promise the conditions for input purchases and for output sales.

In Malaysia, most integrators have gone into contract farming with growers for broiler production. As a result, the integrators are constantly engaged in every phase of production. The growers are provided with chicks from the business hatcheries, feed from the feed production companies, and veterinary services from the company veterinarians, etc. Therefore, although there are key differences between contract farming and total vertical integration (e.g. who is in control of important phases of growth), most features of the supply chain are the same. According to Farelly (1996), one of the most very important issues that must be taken into consideration when drawing up a contract is which party owns the birds during the growing stage. This is because the incentives due to all the parties concerned are determined by the ownership. Procurement contracts usually prescribe that the growers buy the chicks from the integrator. Thus, the subcontractor attains ownership for the duration of growth (i.e., until the birds are ready to be sold back for the price specified in the contract). Alternatively, total contract

agreements prescribe that the growers maintain ownership of the broilers throughout the growing stage because they are given all the inputs (including the chicks) for free.

As with totally integrated production systems, the integrator is in charge of all the scheduling in contract production systems. Hence, the integrator reaps the benefits of efficient scheduling and reduced transaction costs. The rearing period will be similar to that of vertically integrated production, with more variations occurring as a result of varying levels of technology adoption (6-8 weeks). Once the integrator has collected the market-ready birds, the subcontractor may have a 4-6 week "break" from raising chickens, during which he has the opportunity to clean the facilities. Usually growers can raise five or six batches of broilers annually if they work at full capacity.

The current activities along the broiler supply chain are illustrated in Figure 2.3. These activities comprise the raising of grandparent and parent stocks, the hatching of breed chicks, the rearing of broilers for meat production, the processing of whole chickens and further value-added packaging of chicken meat (in whole or in parts), and the sale of both live broilers and dressed chickens.

Advantages and Disadvantages of Contract Production

In order to have a long-term broiler production that is successful, it is necessary to start with a well-written contract that is understood by both parties. The advantages and disadvantages of contract production can be assessed from the points of view of the producer (grower), the producer's lender and the integrator (supplier). Some of the advantages for the producer are lower market price risk (for chickens and feed), the provision of management assistance, and the estimation of a predictable cash flow

according to management averages. The possible disadvantages for the producer include the removal of additional profit opportunities, the sharing or relinquishment of some amount of control of management decisions, and lack of equity in broiler production. The logical concerns that may emerge when an integrator's profit margins are being narrowed may include: 1. Will the company carry on supplying broilers? 2. How many broilers per flock will be supplied? and 3. How many flocks will be supplied annually? These issues are of particular concern as long as payments still need to be made to the broiler house. The undertaking of sole responsibility for waste management and environmental practices that are bound by state and federal regulations is another possible disadvantage to the producer.

The grower's lender may see the reduction in market risk and management assistance as being beneficial, while the non-beneficial aspects of contract broiler production to the lender may include the lack of equity in livestock and the dependence on the renewal of the contract for loan repayments and probably as well, a lack of knowledge and experience with regard to poultry production. From the integrator's point of view, contract production provides security in terms of production capacity, the reduction of risks such as the outbreak of diseases, rapid expansion of the company, the requirement of less capital for growth (reduced land, building or equipment investments), and the inclination of growers to produce more since the company will be able to provide management assistance, and good quality broilers and feed. Contract production enables the company to make the maximum use of the plants and mills (thus lowering overhead costs for each unit of production) by maintaining all the stages of the operation at full capacity. The disadvantages for the integrator may include the bearing of all the short-

term risks that accompany low market prices, and growers who may or may not be very productive. Integrators are also hard pressed to assume greater responsibility for waste management, environmental, animal welfare and bio-security issues. Hamilton (2001) mentioned that it is crucial that all issues pertaining to contract production, particularly with regard to the broilers, be resolved.

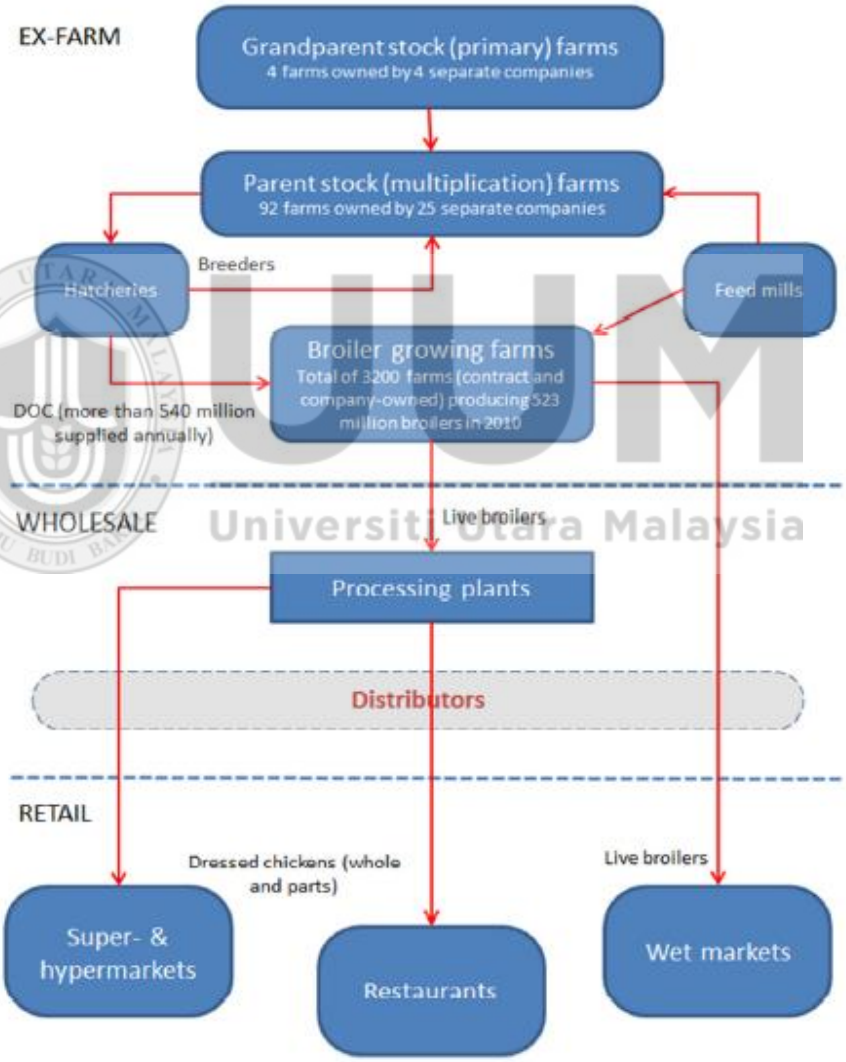

Figure: 2.4
Broiler Supply Chain in Malaysia
Source: Review of Domestic Broiler Market: Issues Paper MyCC, 2012

2.6 Theoretical Underpinnings

Fernie (1995) did a study on SCM in the National Health Service. In fact, it was the first study to be carried out on SCM in the service industry. Sampson (2000) investigated the customer-supplier duality in service organizations in relation to SCM in the service industry. According to a case study carried out by Lau (2007) at the City University of Hong Kong, a dedicated supply chain can be defined as the 'Student' and the 'Research' supply chain. Habib (2009a) conducted the first large scale empirical study to methodically investigate the input and output of the university through an educational SCM. According to Habib and Jungthirapanich (2010a; 2010c; 2010h), this investigative research was focused on the education supply chain, the research supply chain, and educational management as key components in an Integrated Tertiary Educational Supply Chain Management (ITESCM) model. Furthermore, according to Habib (2010b; 2010d; 2010e; 2010f), its applicability was successfully confirmed and substantiated through data obtained from a survey conducted among leading tertiary educational institutions around the globe. The development of SCM was derived from military logistics (Coyle *et al.,* 2003). Later, Ketchen (2006) proposed that the best value supply chain can be investigated by using organizational theories, which are distinguishable from the traditional supply chain, for survival in a competitive environment. Modern competition is increasingly being perceived as an improving that is being fought between supply chains rather than between businesses (Ketchen & Guinipero, 2004). The important theories concerning transaction costs (Ketchen & Hult, 2006; Hobb, 1996; Ellram, 1996), competitive strategy (Porter & Howard, 1997) and network theory (Ketchen & Hult, 2006; Thorelli, 1996) have been used for this literature search.

According to Hobbs (1996), the transaction cost theory proposes that vertical integration and obligation contracting (cost and time) provide organizational flexibility for the survival of a business in a disturbance environment. Hence, Ketchen and Hult (2006) elaborated that managers should reduce transaction costs to a minimum by choosing the right approach when deciding whether to make or buy, while identifying factors such as fair market prices and negotiations. As such, managers must be able to manage these consistencies in order to find the right balance in relationships across a supply chain. Hobbs (1996) suggested that SCM brings together the obligation contracts and vertical integration advantages, while each supply chain member spreads the risk of assets ownership and reduced market risk through improved communication and coordination. Members of the supply chain value long term commitment through total cost sharing. With this approach, supply chain members ignore short term gains with a community attack. Therefore, the transaction cost theory economically supports the potential development of supply chain capabilities, such as supplier and customer engagement which yield operational, supply and logistical flexibility for organizational business value, and the environmental factors which moderate the extent of the application of this theory.

Initially, Porter (1991) proposed a competitive theory where the cooperation among supply chain partners enabled them to achieve a stronger position together than if they had done so independently of each other. In addition, because of vertical integration, an organization should focus on strategic core assets and capabilities such as lean manufacturing (Womack & Jones, 1996) or postponement (Baemon, 1999), which do not yield any positive benefits unless holistic solutions are sought whereby the organizations

must collaborate with upstream suppliers and downstream customers to attain strategic SCM business performance. This theory supports SCM approaches that extend beyond the organization and provide the value chain with increased flexibility and adaptability. According to Thorelli (1986), the network theory predicts that strong or loose ties that match supply chain needs are formed to maximize performance. Such unique links are established on a case-to-case basis rather than strategically. Again, Thorelli (1986), argued that while strong ties provided greater reliability, loose ties enhanced flexibility. In a conventional supply chain, strong or weak ties are formed on a case-to-case basis without impacting the network structure as a whole. This is unlike the best value supply chain where such a hybrid of ties meets the requirements of the supply chain through reliability or flexibility of performance. (The network theory advocates the fundamental linkage of flexibility and the value chain towards supply chain business performance). When the competitive, transaction and network theories are brought together they drive an organization to combine intra-organization supply chain core capabilities, such as manufacturing flexibilities, lean approaches or postponement, with relational organizational capabilities, such as alliances with suppliers and customers.

However, the three theories only address the economic importance of those SCM benefits that bring the best values of supply chain solution. They lack interpersonal and organizational approaches that ensure smooth planning or implementation. According to Ketchen and Hult (2006), the social capital theory recognizes that the organizations in the supply chain nodes are made up of people and that it is the interpersonal skills and relationships that exist between these people that determine the outcome of the supply chain activities. Ketchen and Hult (2006) stated that the members in best-value supply

chains shared the same goals, and had a strong relationship with each other based on trust and willingness as opposed to those in the conventional supply chain, who each had conflicting loyalty and difference supply chain interests.

This subsection illustrates the relevant supply chain theory applications (transaction, competitive, network and social capital theories) that will be employed later to support the research framework. Table 2.1 gives a summary of the relationships of the possible constructs or variables that are to be examined.

Table: 2. 1
Implications of Supply Chain Management Theories on Research Constructs

Authors	**Theory**	**Interpretation**	**Supporting Research**
Hobbs, 1996	Transaction	On the basis of make versus buy, it focuses on total cost.	It supports the contemporary supply value chain concept that benefits the organization as a whole. Hence, loose vertical integration, such as strategic supplier alliance or value chain flexibility, can be constructed on such a premise.
Ketchen and Hult, 2006	Cost	Long term, loose vertical integration based on trust; succeeds short term financial gain.	No matter how well the supply chain capabilities intervene in a flexible value chain, there must be a balance of interpersonal skills and leadership by the organization. Hence, it supports the construct of organizational capability.
	Social Capital	Shared goals, values, experiences, common decision-making and improved performance.	

Table: 2. 2 (continued)

Porter, 1991	Competitive	Cooperation of supply chain partner achieves stronger position together than it could achieve independently.	It supports the contemporary concept where a value chain that embraces upstream and downstream growers must be seen as a cohesive value chain to realize the competitive advantage through proper dissemination of information and materials flow. Hence, this supports the organizational development of the supply chain core capabilities and must be supplemented by rational or organizational capabilities that are strategic in nature.
Thorelli, 1986	Network	Strong and weak ties that exist in a supply chain and create values to enhance the business performance of the supply chain.	Supply chain adds value to the business. It also demonstrates the inter-dependencies between players within the chain. Thus, the theory provides relevant underpinning for the construct of relationship variables between players within the supply chain.

Supply chain management is being described as the management of relationships in more and more studies and researches. According to Harland (1996), managers and authors of various branches of knowledge and functions agree that companies are becoming increasingly dependent on their relationships with their suppliers. Another feature that must be taken into consideration in the study of supply chains is the degree of power among the actors in the chain. According to Nohria and R.G.Nitin-e-Eccles (1992), the idea of the organization being a part of a network has made possible a more efficient way for understanding the impact of power in organizations. Some issues with regard to strategy, technology, relationship (Harland, 1996) and power (Nohria & R.G.Nitin-e-

Eccles, 1992) have been presented in many researches as factors pointing to the success of supply chain management (SCM). However, the measurement of supply chain performance is gaining importance in many management studies. The Council of Logistics Management conducted a research in 1989 in which it was found that the measurement of performance was one of the main features that identified those companies that produced better performance (*Council of Logistics Management: World class Logistics: the Challenge of Managing Continuous Change*, 1995). According to Brown and Laverick (1994), although many studies on performance measurement are available in the literature on management, and these have been developed and improved over time, most of them are geared towards the efficiency of the individual organization. However, the new perspective of SCM that highlights the integration and interaction between companies sheds new light on the topic and calls for fresh studies (Chakravarthy, 1986; Eccles, 1991; Kaplan & Norton, 1992; Venkatraman & Ramanujam, 1986a). The environments in which these chains are operating in are undergoing rapid changes, and in order to respond to these changes managers will need to have accurate and adaptable performance metrics. (Caplice & Sheffi, 1994) affirm that although many supply chain models are presented in the available literature, very few studies have managed to define systems for the evaluation of supply chain performance. Furthermore, they also conclude that the few existing models apply ineffective performance metrics which are limited in scope. One of the greatest challenges faced by companies today is to develop and execute new performance measurement systems that may be able to steer efforts at improvements based on this novel and modern organizational and operational format known as the supply chain (Van-Hoek, 2001).

Earlier, some authors attempted to provide the theoretical basis for various areas related to the supply chain (SC). For instance, Handfield and Nichols (1999), Mears-Young and M.C. (1997), New (1995), are some of the authors who proposed theoretical frameworks for certain functions of the supply chain management (SCM), such as logistics, total quality management (TQM), and outsourcing (Seuring, 2003). The studies on organizational logistics pointed out the lack of theoretical support in SCM and recommended some constructs for research in this area. In his researches on outsourcing, Brush (1997) proposed the application of the "agency theory" for outsourcing. In the late 1990s and the early 21st century, three leading theoretical approaches, namely the Transaction Cost Analysis (TCA), the Network Perspective (NP) and the Resource-based View (RBV), were used in academic studies of SCM to help to explain and comprehend the existence, management, and limits of SCM. Furthermore, Halldorsson, Larson and Poist (2008) argue that these approaches have helped to address the gaps in SCM studies, but more efforts should be made to develop theories that can explain the different features of SCM studies. Hence, Ketchen, Hult, Rebarick and Meyer responded and to bridge this gap, proposed a set of SCM theories and some organizational views and theories, namely RBV, Knowledge-Based View, Strategic Choice Theory, Agency Theory, Institutional Theory, and Systems Theory, that can be applied to construct a useful perspective for SCM studies. These theories, together with their descriptions and applications in SCM studies will be presented in the following sections. It is important to mention that these theories complement the scientific research in this field and are not mutually exclusive views (Halldorsson, Arni, Herbert-Kotzab & Tage-Skjott-Larsen, 2003). Finally, the application of SC theories in SCM studies will be briefly explained.

Table: 2. 3
Supply Chain Management Theory

Theory	Justification for application in Supply Chain Management
Transaction Cost Analysis	Reducing cost generated through asset specifications and uncertainty. Vertical Integration
Resource-based View	Tangible and intangible resources influence the creation, sustainability, and competitive advantage of the business
Knowledge-based View	Knowledge is a source of competitive advantage. Knowledge exchange increases the creation of the supply chain value.
Strategic Choice Theory	Establishment of structural forms. Manipulation of environmental features. Choice of relevant performance standards.
Agency Theory	Conflicts arising from delegation of authority: encourages internalization. Positive relationship: encourages collaboration.
Institutional Theory	Monitoring the environment for collaborative opportunities. Following the best practice.
Systems Theory	Simplifying the relations among the components of the system in order to gain a better understanding and analysis of the values generated by the supply chain
Network Perspective	Inter-organizational relations between several parties increase the resources, capabilities and competencies of the individual businesses.

Source: Adopted from Grant, 1996

Network Perspective is generally known as a perspective or view. McNichols and Brennan (2006) have described Network Perspective as a theory. The Network Perspective Theory of a business has to do with the arrangement and substance of the relationship between the organization and the other organizations within the group (Hakansson & Snehota, 1995; Moller & Wilson, 1995). According to the Network Perspective, the resources, capabilities and competencies of individual businesses can be increased through the coordination of strategies within a network (Roberts & Mackay, 1998). Like the resource-based view, the network perspective regards organizational resources as the means to acquire a competitive edge (Delfmann & Albers, 2002; Koster, 2002). However, while the resource-based view focuses on the dyadic relationships existing between trade partners (Reekers & Smithson, 1996), the network perspective focuses on several inter-organizational relationships between parties (McNichols &

Brennan, 2006). The effectiveness of networks can be gauged according to different factors, including and not confined to, network size, network range, and network diversity. The network perspective assists in explorations into the relationship between the being the current of separate structural positions within a movement network, and the involvement in interactions with other political actors (Ansell, 2000; Mario-Diani, 2000).

2.7 Identification of Research Gaps

2.7.1 Grower involvement with regard to business performance

It is important for suppliers to be included in any attempt to improve business performance through more efficient management of the supply chain so as to ensure the proper coordination of demand and supply (Mentzer *et al.*, 2001). At the same time, it must be acknowledged that partnerships with suppliers by themselves may not result in a competitive edge, but rather it is the style of involvement with suppliers that should be developed after deciding how close the relationship should be in order to maximize the net benefits to both parties (Lambert, Emmelhainz & Gardner, 1999). In this sense, the basis for involving suppliers in the operational aspects of a business must be steered by a clear business requirement and a merging of interests (Bowersox, Closs & Cooper, 2007). A business has an array of options to choose from when building relationships with suppliers, ranging from formal, codified and contractual relationships to informal, mutual relationships (Kaufman, Plotsky, Nemeroff & Charney, 2000). These relationships can be categorized as being "contractual" and "relational", respectively. Although at present many businesses naturally view the relational model as being superior to the contractual model, recent developments, such as e-auctions, indicate that the contractual model may

be regaining its former popularity. The literature seems to strongly suggest that businesses should aim to develop long-term, stable relationships with major suppliers (Stuart, 1997; Vollmann & Cordon, 1998). Dyer and Nobeoka (2000) suggest that this can take several practical forms. Firstly, businesses can involve their key suppliers in those processes aimed at building their values. Secondly, it is fair to expect key suppliers to maintain high quality standards for products and services (Verma & Pullman, 1998). Thirdly, to match the high level of interaction between the trading partners, the communication system must be able to ensure that the information that is exchanged between businesses and their key suppliers is transparent (Garcia-Dastugue & Lambert, 2003). As such, businesses would have to provide suppliers with information that could help them to improve their quality and capable of receiving. Fourthly, suppliers would be expected to be involved in the development of new products (Ireland & Dale, 2006) and so as to ensure that the relationship stays fair, benefits arising from the cooperation with suppliers must be shared with them (Ballou *et al.*, 2000). Finally, problem solving and planning jointly have been found to be positively linked to levels of trust and business performance (Claro, Hagelaar & Omta, 2003). Recent studies have shown that business performance is positively connected to practices that are the result of the involvement of suppliers in business operations (Scannell, Vickery & Droge, 2000). Therefore, it is logical to suggest that the involvement of suppliers in business operations will have a positive impact on the performance of the business.

2.7.2 Integrator involvement with regard to business performance

There are many sound reasons as to why some businesses prefer not to relate openly with integrators and growers. According to Cetindamar *et al.,* (2005), some of these reasons could be the possibility that these engagements could turn out to be expensive, difficult to handle, lead to a loss of control, become the target of opportunistic actions, and might even be illegal in some cases if competition is lessened. However, Wisner (2003) and Lambert *et al.*, (2000) point to the growing body of evidence to show that working with both the key integrators and growers is effective in many ways. This is mainly based on the assumption that businesses should develop suitable relationships with both the growers and the integrators as it could be short-sighted and less than ideal to focus on one single group (Taylor & Fearne, 2006). Several studies recently have illustrated the importance of both supply and demand sides of the supply chain equation. Higher levels of performance have been linked to the degree to which businesses have included both integrators and growers in the planning, networks and logistics of the businesses (Frolinch & Wesrbrook, 2001). It has also been shown that the development of a supply chain wide approach to collaboration is effective in facilitating integrators to respond to the changing needs of growers in rapidly evolving environments (Heikkila, 2002). Moreover, studies investigating the relative importance of internal and external integration (i.e. within the business and between businesses) have reported the existence of "synergistic" effects, thus suggesting that simultaneous integration may be better than a sequential approach (Droge, Jayaram & Vickery, 2004). The internal sets of skills, technologies and systems of businesses that are needed for grower-end interactions to be like of similar those required for exchanges with integrators. This is particularly so where

there is a rather standard corporate culture to be in every part the whole organization. Therefore, it can be assumed that businesses with strong grower relationships would also have strong integrator involvement, i.e. there would be strong collective arrangements on both the demand and supply sides.

The importance of this study is emphasized by the fact that past researches were carried out mostly for manufacturing sectors and very few investigations were done on agricultural products, especially for broiler production. Over the past few years, chicken meat has been increasingly consumed by humans and has become an important source of much-needed protein. Generally, this branch of farming has failed to reach its development target for reasons such as low productivity, management weaknesses, business inefficiency, and the practise of outdated production methods (Mirakazadeh *et. al.*, 2010).

2.8 Definition of Constructs

2.8.1 Product Modularity (PM)

According to Schilling (2000), Ulrich (1995) and Lau (2010), PM is a range for describing the separateness, specificity and transferability of the components in a product. A product is transferrable if the components in a product system can be used again by another system (Starr, 1965). Ulrich (1995) states that a product can be separated if it can be taken apart and recombined into a new product design while retaining its functionality. Schilling (2000) describes a product as being specific if its components have clear, unique and definite functions in relation to their interfaces in the product system. If a product is said to have a high PM (i.e. modular product design) it

means that the product's system is made up of separate modules with well-specified interfaces across the modules, such as those found in personal computers. The product modules can be shifted to different product lines and advanced development projects. On the contrary, if a product is said to have a low PM (i.e. integrated product design) it means that the components of the product are highly interconnected without well-specified interfaces across the components, like those found in fine art. It is very difficult to shift these components to other product lines. Product modularity is a construct with many features and very little consensus of definition (Gershenson, Prasad & Zhang, 2003). The concept of modularity in academic literature was first proposed by Simon (1962) when he presented the topic of almost decomposable systems. Sanchez and Mahoney (1996) state that such decomposable systems are modular when they have a high degree of independence (loose combination). A modular architecture is a unique form of product design in which standardized component boundaries are used to achieve a loose combination which enables the production of a large number of end items. This was one of the predecessors of mass customization (Worren, Moore & Cardona, 2002). Baldwin and Clark (1997) coined the term "modularity in use" to refer to this ability to constitute the product as needed by considering modularity as a design strategy that avoids producing solid interdependencies among specific components (modules) within the product. The word "module" in this case was defined by Allen and Carlson-Skalak (1998) to mean a set of parts that can be detached as a unit from the product without destroying it. Furthermore, Schilling (2000) states that modularity is a systems concept defining the extent to which the parts of the system may be taken apart and recombined into new designs. According to Carey (1997), the product modularity comprises a design

with subsystems that can be put together and tested before being integrated. For Walz (1980), a modular product is one that is composed of identical units for flexibility and variety of use, whereas Chang and Ward (1995) stressed on the functional dimension in their definition by stating that product modularity is a function-oriented model that can be integrated into various systems for the same operational purpose with only minor modifications. Ulrich and Espingger (1995) broadened this definition to include the requirement that a module should have a unique function or a set of functions. Ulrich and Tung (1991) stressed that the module should possess similarities between the physical and functional structures of the design as well as reduce the related interactions between the physical parts. In addition, Baldwin and Clark (1997), Garud and Kumaraswamy (1995), Sanchez (1995) and Schilling (2000) stress that it is commonly understood that product modularity merges the building blocks that can be integrated to produce a comparatively huge number of product designs. In the literature, modularity and standardization are connected by commonality and product design. The commonality is apparent in the design elements and the components within the product. Evan (1963), Lee and Tang defined standardization as treating the use of common parts as essential to a modular product design. In relation to the architectural element, Ulrich and Espingger (1995) stated that product modularity is the usage of unit standardization (and standardization is made more probable by modular design). Sanchez and Mahoney (1996) suggested that the interface is a critical component of this unit standardization, while Meyer and Lehnerd (1997) reached a similar conclusion when they stated that standardization is aided by product design. Further proof of the linkage between modularity and standardization was provided by Lampel and Mintzberg (1996), who

classified product modularity as segmented standardization. Since several researchers agree that standardization and product modularity are attached by their concepts, they have therefore combined them into a single construct. For this study, product modularity is defined as the use of standardized and interchangeable parts or components that facilitate the designing of a wide variety of final products. This definition assumes the concepts of loose combination, ease of disaggregation, dissimilar outputs, and a one-to-one matching of function to module.

According to Frederiksson (2006), modularity is necessary for companies to enhance their product development lead time for success in their future business objectives. He came to the conclusion that the efficiency of a modular assembly system depends on the use of several coordination mechanisms, such as the use of arrangements, standardization and mutual adaptation.

2.8.2 Internal Coordination (IC)

According to the latest literature, successful product development can only be attained if the organization can efficiently combine internal functional units, including marketing, manufacturing, R&D, and purchasing (Clark & Fujimoto, 1991; Gerwin & Barrowman, (2002). An assortment of internal integration mechanisms (e.g. cross-functional teams, overlapping, employee involvement, concurrent engineering, collocations, dedicated teams, empowered teams) have been proposed for different stages of product development (Griffin, 2002; Hargadon & Eisenhardt, 2000). Hence, in this study, IC is defined as the level of coordination between sales and marketing, research and

development, and production and inventory management all the way through the product development process.

2.8.3 Product Innovativeness (PI)

There are many different definitions for PI in the existing literature (Szymanski, Kroff & Troy, 2007) and so far there is no single definition of innovativeness that has been acceptable, although it is usually considered to be a measure of discontinuity in marketing and/or technological factors in both industries and businesses (Calantone, Chan & Cui, 2006). A comprehensive literature review conducted by Song and Montoya-Weiss (1998), Garcia and Calantone (2002) indicated the importance of considering both the marketing and technological perspectives, as well as the large-scale and small-scale levels, when defining innovations. In their paper, they proposed a method for the classification of innovations to provide practitioners and academics with a common understanding of how to identify a specific innovation type and how the innovation process may be peculiar to that particular type. They also proposed a method for operationalizing PI, whereby it is operationalized as newness to the business, to the industry and to the grower. This approach used impactful measures such as new to the market offerings (Szymanski *et al.,* 2007), and product newness (Avlonitis & Salavou, 2007), but it did not include product advantage and product familiarity, which are conceptually different from PI (Calantone *et al.*, 2006). Products are new to a business when the business has little experience and marketing and technological know-how of the products. Products are new to the customer and industry when the customer and industry

have little experience and technological/marketing knowledge of them (Garcia & Calantone, 2002).

Researchers including Cooper (1979), Zirger and Maidique (1990), Kleinschmidt and Cooper (1991), Cooper and Brentani (1991), Song and Parry (1997), Song and Montoya-Weiss (1998), were involved with a vital part of the research within literature on new products that concentrates on the effect of PI on product performance. Even with the wide ranging conceptualizations and operationalization of the idea of PI, there are currently views which argue that product performance is increased by both higher and lower PI, and decreased by moderate PI (Danneels & Kleinschmidt, 2001). This is especially true for more innovative products which require greater commitment in terms efforts and resources on the part of the business but are likely to result in improved performance because of significant comparative benefits that are gained by ensuring acceptance by customers. Similarly, not so much efforts are required for less innovative products due to familiarity with the core products of the business. Since they gain from experience, competencies and resources that are specific to the business, they have a greater likelihood of success, thus resulting in better performance. Based on the above, this study aims to provide fresh evidence with regard to PI as a phenomenon and extend the empirical literature to cover the connection between PI and performance. In particular, this study categorises businesses based on the three facets of PI and searches for differences in product- and business-based performance, while focusing on the context of industry. In fact, the major question still remains as to whether smaller businesses are more active and successful than larger businesses at product innovation. Despite the constant, ongoing debate on this issue (Fritz & Schiefer, 2008), smaller

businesses are perceived as being more innovative than larger businesses for several reasons (e.g. speedier response to market changes and requirements, easier acceptance and implementation of change). Many studies use this line of reasoning in their attempts to categorize the innovative behaviour of small businesses (Hadjimanolis & Dickson, 2000). In the proposed alternative typologies, two polarized innovation strategies (i.e. the strategies behind innovation) are contrasted, such as proactive innovators versus non-innovators or the consideration of intermediate conditions, such as reactive innovators. However, there is insufficient evidence in the literature with regard to the PI typologies and their connection to business performance within small businesses. For this reason, it is necessary to turn to qualitative evidence from the Malaysian context. Given the above factors, the research questions that are raised in this empirical study are aimed at identifying the differences, if any, in performance measures at both product levels.

2.8.4 Supplier Involvement (II)

According to Song and Benedetto (2008) II is perceived as an important route for the success of a new product. Van-Echtelt, Wynstra, Weele and Duysters (2008), Ragatz, Handfield and Scannell (1997) defined II as the direct participation of the integrator during the product development processes. Fliess and Becker (2006), Takeishi (2001) suggest that it comprises the combined product design, process engineering and production operations with major integrators. II aids in obtaining resources and skills, which the manufacturers do not possess but which are vital for product innovation (Grant, 1996). While the integrator is encouraged to learn new technology applications, the buyer can actively influence product performance (Athaide & Klink, 2009). The core

competencies of a business are those things that can be performed well by a business and that fulfil the following three conditions stipulated by Prahalad and Hamel (1990) i.e. first, it provides the customer with benefits; second, it is difficult for competitors to copy; and third, it can be used to maximum advantage for many products and markets. There are many different forms of core competencies including knowledge about technical and/or subject matters, dependable processes, and close ties with customers and integrators (Mascarenhas, Baveja & Jamil, 1998).

2.8.5 Grower Involvement (GI)

Feng, Sun and Zhang (2010), Brown and Eisenhardt (1995) defined GI as the direct participation of the grower in the design and development phases of product development, in which the grower is involved in problem-solving and works together with the manufacturers to develop the end product. It involves a combined product design, process engineering, and production operations with major growers. According to Brown and Eisenhardt (1995), Clark and Fujimoto (1991), the early participation of growers or initial grower input is vital in the development of new products. It helps the project teams to identify fresh ideas and opportunities while avoiding development delays due to disparities between ideas and the needs of growers (Ittner & Larcker, 1997). External communication with major growers has been emphasized as being a key success factor for product development projects (Katz, 2003; Von-Hippel, 2005). As Brown and Eisenhardt, (1995) suggest, the reasoning behind this is that such external communication increases the amount and diversity of information, thus resulting in an increase in the quality of the development process. Direct interaction with growers is like a high-

bandwidth mode of communication. "The unique capacity of informal and generally face-to-face communication is to facilitate transfer of complex, ambiguous and novel information, and to provide the possibility to capitalize on surprising and unexpected answers" (Salomo, Steinhoff & Trommsdorff, 2003).

2.8.6 Business Performance (BP)

According to Kaplan and Norton (1992), if organizations are unable to measure performance, they will not be able to manage their business. If organizations are to survive and flourish in this highly competitive age of information they must employ measurement and management systems that originate from their strategies and skills. This statement sums up the need to measure performance and, as a direct consequence, to assess the performance of a business (O'Raily, Wathey & Gelber, 2000). In summarizing the views of many authors, it can be said that the aims of evaluating the performance of a business are to ensure that it complies with important minimum standards, to check how well the organization is doing, to test strategic assumptions, and to provide a consistent basis for communicating with interested parties (Coelho, Yivisaker & Turkstra, 2005). The business performance extends the areas of measurements to the three perspectives by Maluenda (2006) to cover innovation, rate of new product development, grower satisfaction, grower retention and operating costs (Zack, McKeen & Singh, 2009). Business performance is defined as the measurable outcome of the level of achievement of the goals of the organization by Daft and Marcic (2001) or the measurable outcome of the way the organization manages its aspects (ISO 1999), or the mechanism for improving the probability that the organization will be able to successfully implement a

strategy. Business performance evaluation is a process to help the management make decisions concerning an organization's performance by choosing indicators, accumulating and analysing data, assessing information against performance criteria, reporting and communicating, and regularly re-examining and improving this process (Coelho *et al.*, 2005).

Stuart and McCutcheon (2000) suggest that the most effective relationships are found where the supply chain partners have been alerted to the performance standards that they are being held accountable to. The selection of performance measures is aimed at ensuring that companies attain the particular collaborative goals that were set. These characteristics combine the main requirements that organizations have to constantly address, evaluate and benchmark against when intending to continuously enhance business performance. According to Tummala, Philips and Johnson (2006), the business performance measures that an organization fixes for itself and others should be precise, measureable and regularly assessed, and whatever measures are selected should be implemented. In the context of the supply chain, companies now realize that it is important for financial and non-financial measurement systems to cover all aspects of performance that are related to the existence of an organization and the means by which it attains success and growth (Hillman & Keim, 2001; Kaplan & Norton, 1996). In other words, any performance measurement system must include more than just financial measures. This is a well-founded point as many scholars assert that there must be more than one criterion to any reliable model of performance measurement (O'Regan & Ghobadian, 2004). According to Gupta and Somers (1996), the financial performance of a business has been most widely used to ascertain its organizational health. The normal

markers include return on investment (ROI), return on sales (ROS) and return on equity (ROE). A wider conceptualization of business performance stresses on the operational indicators (i.e. non-financial) as well as the financial indicators. As suggested by Venkatraman and Ramanujam (1986b) the inclusion of performance indicators takes us beyond the black-box approach that seems to characterize the exclusive use of financial indicators and focuses on those key operational success factors that might lead to financial performance.

Previous studies show that researchers used both financial performance measurements and non-financial performance measurements. They used two dimensions of financial performance, i.e. net profit performance (NPF) and sales growth performance (SGP). Profitability and sales are the most common types of performance indicators used in the industry (Fantazy & Kumar, 2009). Two important dimensions of non-financial performance were used: customer satisfaction performance (CSP) and lead time performance (LTP). According to Tracy (2004), CSP is the extent to which growers sense that they have obtained products or services that are worth more than the price they paid. LTP refers to the time interval between the receipt of an order and the delivery of the finished goods. The reduction in lead time results in a reduction in the supply chain response time, and that is why LTP is a vital performance measure and a source of competitive advantage; it directly interacts with customer service to determine competitiveness (Christopher, 1992).

Various studies previously attempted to establish a suitable measure of performance that would embrace all the performance targets. The various representations used in these studies contributed to the not clearly expressed findings with regard to diversification and

the performance relationship. Most literature made use of the accounting measure to represent performance. However, this measure has been criticized because it is open to manipulation (Buhner, 1987). Since investors arrive at investment decisions based on accounting figures, better results should lead to higher share prices (Dubofsky & Varadarajan, 1987). However, the indication is diverse where accounting measures of performance support undiversified businesses compared to market measures of performance which good will diversified businesses (Dubofsky & Varadarajan, 1987; Hitt & Ireland, 1986). The reason for the differing evidence may point to the existence of market defects as well as the use of different representations for the accounting measure (Lee *et al.,* 2003). The representations for accounting measures proposed in the literature include return on equity (Syed & Rao, 2004), return on sales, return on invested capital, and compound sales growth (Simmonds, 1990). Both studies did not find any obvious relationship between diversification and the mentioned variables. However, the results are significant with regard to return on assets, which is another representation of an accounting measure of performance (Simmonds, 1990). As a result, most studies include return on assets as an accounting measure. Bettis (1981) mentions that return on assets is extensively used by practitioners and academicians because it controls differences in the financial structure of a business. As the results are vague when an accounting measure of performance is used, some studies have adopted market measure as an alternative representation. Even though both measurements may be limited in their capability at measuring performance, at least a combination of measures (accounting and market measures) will be able to capture practically all the performance targets of a business. Therefore, it appears to be necessary to combine several measures in order to analyse the

relationship between diversification and performance (Simmonds, 1990). There is no single measure that meets all the performance criteria and multiple measures may be adequate to establish the strength of the findings (Tongli, Ping & Chiu, 2005).

The other area of research that attracts researchers is the investigation of organizational performance, which is always a dependent variable. This dependent variable could be the financial performance of the organization or the operational performance or it could involve both performances. For that reason, this review will categorize the literature into non-financial performance, financial performance and both performances (financial and non-financial).

There is a lot of literature available with regard to non-financial performance measures. The suggestions in the literature are mixed. The inconsistencies in the results are explained by the contextual differences and the motivation for the management in seeking certification. For example, Roa, Ragu-Nathan and Solis (1997) surveyed companies in China, India, Mexico and the United States to ascertain the effects on quality management practices and self-assessed measures of non-financial performance. Non-financial performance is referred to as organizational operating performance which consists of productivity, rework, throughput time, market shares and others. The results from the survey revealed that there was a significant effect on quality management practices such as leadership, strategic quality planning, good integrator relationship and customer satisfaction, which are significantly connected to rework, throughput time, productivity, and market share.

Another study conducted by Elmuti and Kathawala (1997) on two manufacturing plants in a large organization in the United States showed that the plants recorded an increase in

employee productivity, enthusiasm, and goal equivalence with a reduction in absenteeism, rework, and defective items. Sun *et al.,* (2010) found that Norwegian companies with good practices reported that these had a direct influence on the reduction of bad products and customer complaints, and increases in both profitability and productivity. Consistent effects were observed by Bayati and Taghavi (2007) in their research conducted in Tehran on small and medium enterprises (SMEs) in which it was discovered that there was an improvement in the organizational performance in terms of quality, documentation and standardization of procedures, customer satisfaction, quality awareness, teamwork and organizational communication.

Several researchers investigated the relationship between quality improvement and the financial performance of the organizations. Where the secondary data involving the financial statement of the organization was used, the results of the study revealed that a positive relationship exists between quality and financial performance, which does influence the profitability of the organization. This contradictory finding may be due to the performance of the organization before and after the implementation of quality. Most of the data in this study is comprised of secondary data derived from the financial statements of the organizations. The previous performance of the organizations may influence their performance after quality implementation. It was suggested by Heras, Casadesus and Dick (2002a) while controlling the pre-certification performance in their univariate test that quality does not increase profitability. Organizations are usually defined as instruments of purpose and they coordinate the functions on a continual basis to achieve a common goal or set of goals. In order to measure the achievement of set goals, there is the measure of performance. In the Oxford Advanced Learner's

Dictionary, 'performance' is defined as "how well or badly it does". There are many terms used in existing literature with regards to performance such as business performance, organizational performance, financial performance, and operational performance. Table 2.3 summarizes the different types of performance measures that have been used. These different types of performance measures can be grouped into two aspects, which are; 1) financial aspects and 2) non-financial aspects.

Table: 2. 4
Different Types of Performance Measures

Authors	Financial Performance	Corporate Performance	Operating Performance	Business Performance	Organizational Performance
Mentzer, DeWitt, Keebler, Min *et al*,.(2001)	√				
Lambert *et. al*,. (1999)		√			
Bowersox, Closs, & Cooper (2007)	√				
Martínez-Costa &Martínez-Lorente, (2007)					√
Agus (2011)				√	
Abas (2006)					√
Abdullah, Uli, &Tari (2008)			√		
Ahangar (2011)	√				
Ahuja &Khamba (2008a)			√	√	

According to the literature, there is no distinction between financial and operating performance. Operational and financial performance is often merged into business performance, like in the studies conducted by the above authors. The implementation of a quality management system may improve the operation of the organization. Naveh and Marcus (2004), investigated the relationship between quality assimilation with operational and business performance by using accounting data as a measurement. Therefore, this study will investigate the relationship between the operational construct

and organizational performance. The organizational performance in this study will, once again, be grouped into two aspects, the financial and non-financial elements.

Financial performance is a crucial measure of total quality management, and this is consistent with the argument that quality enhancement results in the removal of waste, lowering of costs, and better financial performance. Usually the operational definition of financial performance includes the profitability of the organization, the revenue generated during the period and any other financial ratios such as return on assets (ROA), return on sales (ROS), cost of goods sold (COGS/Sales) ratio . Most of the financial data is based on the accounting data.

In early literature, the benefits derived from quality implementation were more towards improvements in terms of operational performance, also known as organizational effectiveness or as non-financial performance. Among the items that are part of non-financial performance are improvements in the defect rate, production cycle time, productivity, punctual delivery and also the measurement of customer satisfaction .

The most extensively used dependent variable in organizational research is probably organizational performance. Nevertheless, it is still a term that is unclear, with loosely defined constructs. Several studies have used different methods to measure organizational performance. The concept of organizational performance is founded on the idea that an organization is a voluntary alliance of productive assets, including human, physical, technological and capital resources, aimed at achieving a common purpose. The achievement of organizational performance is made up of the actual outcomes or results of an organization as measured against its expected outcomes: targets and aims (Saraiva & Duarte, 2003). Organizational performance has also been used as an

indicator to measure how well an organization achieves its objectives . According to Robins and Coulter (2009), the performance of an organization can be gauged by the efficiency of the organization and its effectiveness in achieving its goals. However, there are substantial difficulties in measuring the organizational effectiveness.

According to Richard, Devinney, Yip and Johnson (2009), organizational performance covers three precise areas of business outcomes: financial performance, which is comprised of profitability, return on assets, return on investments and others; product market performance, which is comprised of sales, market share and others; and last but not least, shareholder return, which is comprised of the total shareholder return, economic value added and others. Having recognized the interest of stakeholders, Weerakoon (1996) developed the Multi-Model Performance Framework for measuring organizational performance as presented in Table 2.3. This framework was later used by Lai and Cheng (2005) for their research into the relationship between quality management and performance. Table 2.4 below shows the measurements for organizational performance; motivation performance, market performance, productivity performance and societal performance (Weerakoon, 1996).

Table: 2.5
Dimensions of Performance

Dimensions	Items Measured
Motivation performance	Fairness of company towards employees; training provided to employees; employee job satisfaction; employee job security; environmental issues affecting the work.
Market performance	Rate of success in proposing new or modified products to satisfy grower needs; competitiveness in terms of the product/service price, ability to satisfy grower.
Productivity performance	Efficient use of materials, labour, and capital utilization
Societal performance	Degree of consumer rights; recognition of the need to conserve the environment; growth of the product/market; provision of employment opportunities

Source: Weerakon, 1996

In general, organizational performance is comprised of measurements, which can be either objective or subjective. Kanji (2002) identified four major areas for the measurement of organizational performance, namely:

(1) Maximize stakeholder value;

(2) Achieve process excellence;

(3) Improve organizational learning; and

(4) Please the grower.

These four major areas are also in agreement with the four perspectives of a Balanced Scorecard as recorded by Kaplan and Norton (1996).

The financial perspective describes how the organization desires to be seen by its shareholders. The grower perspective determines how the organization desires to be seen by its growers. The internal business process perspective representation how the organization carries out its business processes to please its shareholders and growers. The organizational learning and growth perspective includes the modifications and improvements which are required by the organization in order to attain its proposed goals. However, organizational performance is measured in various terms such as financial performance, grower satisfaction and operational results. In addition, the application of quality improvement has also contributed significantly to financial and non-financial performance. Even though financial information has the benefit of being accurate and objective, there are drawbacks to such a measurement. Among the more backwards are that the financial measurement tends to be narrow or towards the inside looking, and that it fails to cover the less quantifiable factors such as product or service quality, grower satisfaction and employee morale. Lastly, it is lacking in indicators of past occurrences and have poor performance predictors of future performance. Dent (1990) suggested that a broader use of non-financial measures of performance would provide more comprehensive indicators of the attainment of the strategic goals of an organization. Table 2.5 below presents the authors who have discussed organizational performance, either from a financial aspect only or from a non-financial aspect or both:

Table: 2. 6
Organisational Performance, Financial and Non-Financial

Financial Performance		**Non-financial Performance**	
Author	Item measures	Author	Item measures
Terziovski *et. al.,*	Cash flow, market share, sales and export	Terziovski *et. al.,*	Delivery time, guarantee costs, quality costs, rate of defects, productivity, grower and employee satisfaction, innovation and number of employees.
Sun	Profitability	Sun	Product quality, grower satisfaction, productivity, market position and competitiveness.
Han *et. al.,*	Profit and market share		
Marti'nez-Costa *et. al.,*	Sales growth, personnel expenses, earnings before tax, ROA Improvement in company results, investment on means		Improvement in production process, grower satisfaction, personnel motivation
Dunu	Revenue/Total assets, Operating Income, Operating income/ Total Asset		
Jang *et al.,*	Market shares	Jang *et al.,*	Market performance, operational performance
Naveh *et al.,*	Market share, sales and export growth	Naveh *et al.,*	Defect rate, cost of quality, productivity, prompt delivery to grower, grower satisfaction.
Corbett *et al.,*	ROA and ROS, Tobin's Q, Low COGS/Sales and sales growth		
Feng *et al.,*	Market share, profitability	Feng *et al.,*	Cost reduction, productivity, quality improvement, grower satisfaction, internal procedures, employee morale, corporate image, competitive advantage, access to global market.

The issues that were brought up in the organizational performance literature were not just confined to the question of what dimensions are required in order to measure the performance of an organization but also to the question of how the dimensions of organizational performance can be operationalized. If the performance data are available to the public, such as profit, return on assets and return on investments, then the researcher is able to have direct access to the published data. However, if the performance data are not publicly available, such as data on delivery speed and dependability, manufacturing lead time, inventory turnover rate and grower satisfaction, then the data of performance can only be collected by employing a self-rating evaluation. In view of this fact, this study used the self-rating evaluation method to collect the necessary performance data regarding livestock based companies, and the issues related to this method is discussed in the following section. A few researchers have used a different approach to measure performance in the livestock industry, specifically in broiler production. The performance indicators for the performance of the broiler business are shown below in Table 2.6.

Table: 2. 7
Performance Indicators for Broiler Business Performance

Performance indicators	Advantages	Disadvantages
Financial return per bird	The financial measure for determining the financial return per bird can be used to determine the financial margin	Historic measure unable to affect current performance. Cannot compare different production systems as the density of stocks may vary. Reducing financial costs alone may have consequences on welfare interests.
Financial returns per kg live weight	Measure for ascertaining financial return can be used to conduct a financial comparison between sites and production systems.	Historic measure of performance. Reducing financial costs alone may have consequences on welfare interests.

Source: L. Manning, R. Baines and S. Chadd, 2008

The performance measurement is different in the poultry industry compared to the manufacturing industry as was elaborated in the previous section. Manning (2004) argued that it is difficult to measure broiler production effectively because the benchmarking methods for the livestock industry may tend to be excessively focused on historic data rather than on identifying and implementing the current best practice. A livestock supply chain benchmarking that is effective is more than just a comparative analysis of the cost structure. There needs to be a comprehensive understanding of the processes carried out in order to determine the ideas and information that should be shared both vertically and horizontally in the chain, which will in turn generate compliance with stakeholder requirements and drive constant improvement. Horizontal private benchmarking systems guarantee confidentiality whilst providing a tool for driving business improvement. In public benchmarking, where all the members of the supply chain can freely access the results, the powerful members of the chain, for example, the processors or retailers, may end up pressuring the primary producers to shift all the cost benefits to them. This means

that the primary producer does not always benefit financially from their improved performance.

2.8.7 Managerial Skills (MS)

Economic theory recognizes several processes by means of which skill is created and contributes to business performance. Despite the significance of skills in economic theory (Loasby, 1999), it seems that insufficient focus has been given thus far to skill creation in the division of labour in the agri-food sector. It recognizes that skill creation characterizes agri-food systems at the level of both whole chains and groups of agents (Fritz & Schiefer, 2008; Sporleder & Wu, 2006), and maintains that organizational skill is an effective source of competitive advantage (Schroeder, Bates & Junttila, 2002; Teece, G.Pisano & Shuen, 1997). It seems that a specific characteristic of the agri-food sector, which offers important examples on how organizational choices positively influence the level of skills, is related to the peculiar distribution of the sources of codified and tacit knowledge by Nonaka and Takeuchi (1995) with farms mainly involved in the creation of tacit knowledge.

Researchers are paying increasing attention to food supply systems (Lindgreen, Hingley & Trienekens, 2008; Menard & Clein, 2004; Omta, Trinekens & Beers, 2001; Sonnino & Marsden, 2006; Borgatti, Mehra, Brass & Labianca) and this reflects both the complexity of the sector's organizational arrangements and the growth of analytical interest in networks analysis. Today, this industry is being threatened by the harsh economic practices of governments and the greatest challenge from governments is for particular attention be given to management procedures with regard to poultry production so as to

increase efficiency (Oknkow & Akubuo, 2001). This is due to the fact that management is the invisible factor in the production process that will have a growing impact. Management is being introduced as the fourth factor of production after workforce, capital and land, and plays a vital role in all these three factors. In order to maintain the quality of management, it is important in theory for each production to resort to using certain indexes of quantity until they can be applied in the production function (Hamidi, 2005). Hence, agricultural production managers and producers are deemed to be the most efficient mediators for managing the efficiency and productivity of the business. As such, it is important to evaluate their performance and efficiency as well as their role in achieving the objectives of farm management. Amini and Ramezani (2007) have proposed that managerial skills and proficiency be included as inter-organizational elements that are vital to successful cooperation in the poultry industry. Farm managers need to be equipped with a set of managerial skills so as to be able to function with maximum efficiency to achieve a target. These managerial skills will assist managers in making the right decisions with regard to finances, workers, land resources and risk prevention, while helping producers to gain access to possible levels of income and so determine what to produce, in which section of the farm, using what methods, when and how much, and thus make decisions based on all the relevant facts (Al Rimawi, Karablieh, Al Qadi & Al Qudah, 2006; Al Rimawi, Emad & Abdullah, 2004). This study will discuss the possible role of managerial skills as a moderating variable between the abovementioned independent and dependent variables.

The grower's managerial skills determine the growth or demise of the broiler business. From a management perspective, an operator can increase profits by monitoring feed

waste and taking the necessary steps to reduce it, watching out for wasteful use of water, maintaining a dry and clean environment, being vigilant when it comes to fan breakdowns, and looking out for symptoms of stress and disease.

2.9 Theoretical Framework and Hypotheses Development

Ernst and Kamrad (2000) and Sanchez and Mahoney (1996) suggested that when a product is designed with a high PM it indicates that the product has been put together from a set of individual modules with uniform interfaces across the various modules. The modules are highly distinguishable and follow strict specifications. Hence, Novak and Eppinger (2001), and Schilling (2000) emphasize that they can be successfully outsourced to the integrators. SI becomes increasingly important for the specification and creation of modular products once the production of the modules or components is contracted out to external partners. If the interfaces of the modular product are to be designed correctly, then information must be gathered with regard to the market and the preferences of growers (Du, Jiao & Tseng, 2001), information must be exchanged between different designers in the organizations concerned (Brusoni & Prencipe, 2001), and information regarding engineering limitations must be shared with supply chain partners (Erixon, 1996). Information on marketing, production and technology derived from integrators in current modular product development projects can be determined and used once again to improve on the design of future modular products (Kotha, 1995). Other literature suggests that the development of a modular product requires a process of repeated co-development with integrators to outline once again the interface specifications for new products (Sabel & Zeitlin, 2004). Case studies have indicated that

integrators need to be very much involved in the design of modular products (Brusoni & Prencipe, 2001). However, there has been very little discussion on the impact of modular design on CI. After product modules have been selected to be used once again in future product development projects, CI helps manufacturers to anticipate changes in grower needs in the future (Kotha, 1995). According to Lau (2009), when modular products are developed, manufacturers can coordinate with their growers for the purpose of developing customized products and learning from the growers. Mass customization literature show that after a modular design has been adopted, the product modules that enable growers to customize certain parts of the product design and development are specified (Salvador, Rungtusanatham, & Forza, 2004). Under a pre-defined form of modular product architecture, manufacturers are able to involve the growers in gathering intensive grower knowledge on product preferences, modifying or co-creating products without worrying that the grower's ideas are beyond their ability to implement (Von-Hippel, 2005). By adopting a modular design, the manufacturer can modularize specific components to be designed in-house, but offering the other parts to be innovated with the growers. In this way, the technical knowledge of the in-house parts is protected and CI can be advanced (Chesbrough, 2003).

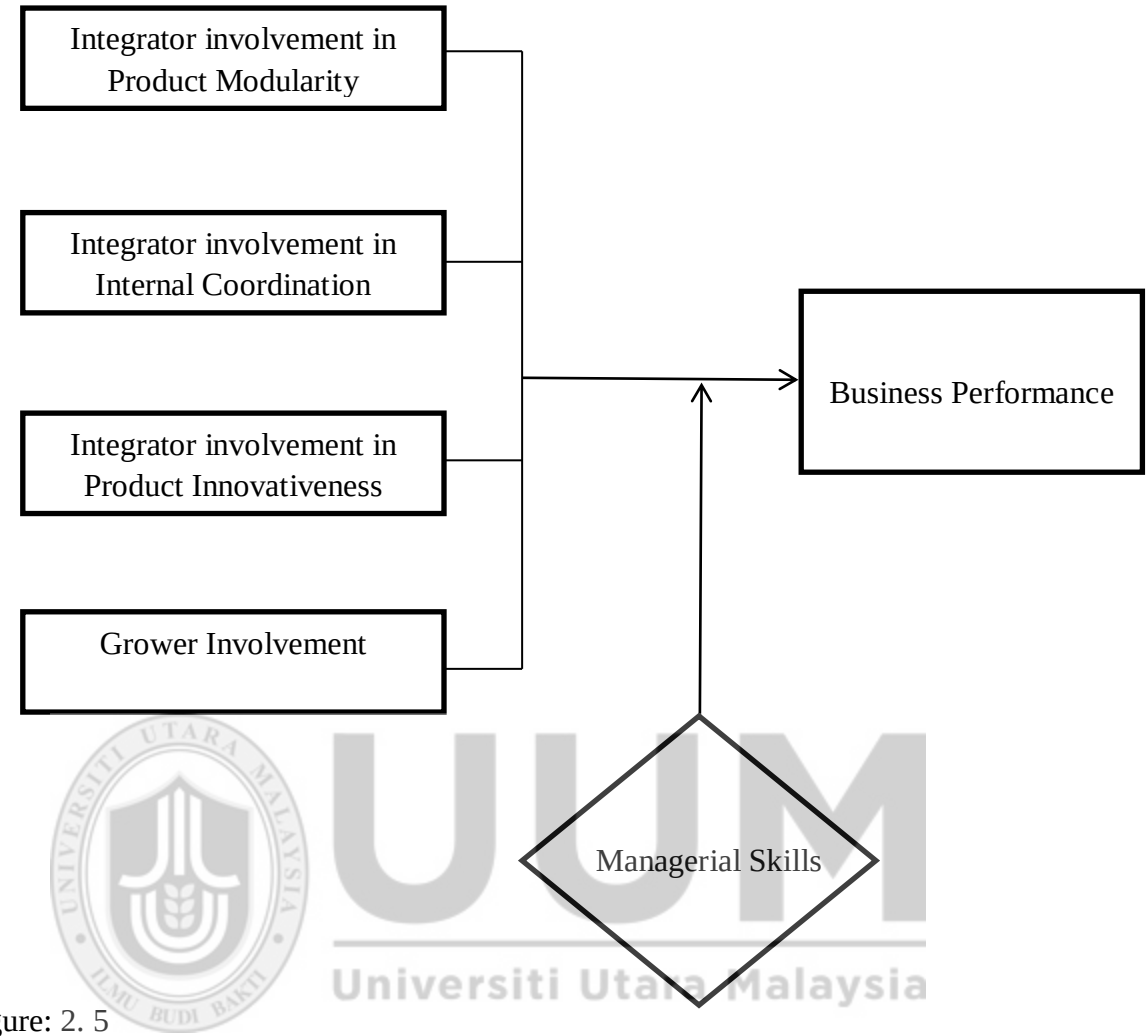

Figure: 2. 5
Theoretical Framework

Thus, this study argues that modular product design induces SCI as they can help solve design problems and create new ideas to define the specifications of the modular architecture and design modules, with better grower satisfaction. The hypotheses are suggested as below:

H1 Integrator Involvement towards Business Performance

H1a Product Modularity (PM) has positive significant relationship with Business Performance (BP Financial)

H1b Internal Coordination (IC) has positive significant relationship with Business Performance (BP Financial)

H1c Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Financial)

H1d Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial)

H1e Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial)

H1f Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial)

H2 Grower Involvement towards Business Performance

H2a Grower Involvement (GI) has positive significant relationship with Business Performance (BP Financial)

H2b Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial)

H3 Integrator Involvement towards Business Performance moderated by Accountancy and Financial Mgt. Skill

H3a Product Modularity (PM) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.

H3b Internal Coordination (IC) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.

H3c Product Innovativeness (PI) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.

H3d Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.

H3e Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.

H3f Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.

H4 **Integrator Involvement towards Business Performance moderated by Decision Making Skill**

H4a Product Modularity (PM) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.

H4b Internal Coordination (IC) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.

H4c Product Innovativeness (PI) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.

H4d Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.

H4e Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.

H4f Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.

H5 **Grower Involvement towards Business Performance moderated by accountancy and financial mgt. Skill**

H5a Grower Involvement (GI) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.

H5b Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.

H6 **Grower Involvement towards Business Performance moderated by decision making skill.**

H6a Grower Involvement (GI) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.

H6b Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.

Previous research was done by researcher related to independent variables that explained the significance to the business performance. The purpose of the research is to analyze the impact of product modularity on new product development (NPD) time performance, and the moderating effects of inter functional integration and supplier involvement on the product modularity-time performance relationship. The framework can be shown as below:

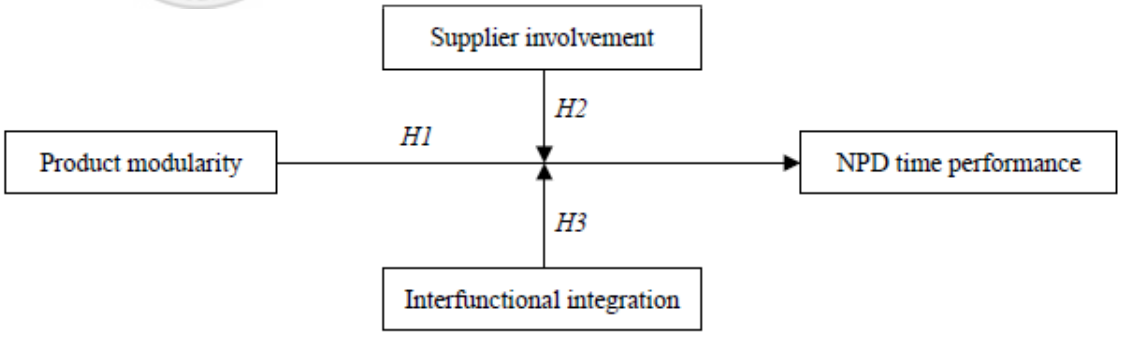

Figure: 2.6
The relationship this research intends to investigate

2.10 Summary

From the literature review, there is a wide coverage of supply chain management concept that impacts on business performance. The supply chain is defined as all the activities concerned with the delivery of a product to the grower beginning with the raw materials, including sourcing for the raw materials and parts, manufacturing and assembling, warehousing and inventory tracking, entering and managing orders, distributing across all networks, delivering to the grower, and the information systems that are required to keep track of all these activities. The SCM synchronizes and combines all these activities into a smooth process, linking all the stakeholders, including the parties within an organization and the external partners such as the suppliers, transporters, third party companies, and information system providers, in the chain. The SCM has also been described as the methodical and strategic management of conventional business roles and the procedures across these business roles within a specific organization and across businesses within the supply chain in order to improve the long-term performance of the individual organization and of the supply chain as a whole. In the poultry industry, the main company within the supply chain framework is known as an integrator. This integrator has a vertically integrated supply chain, being the owner of most of the breeding, feeding, slaughtering and processing facilities. It makes use of the latest technology and maintains stringent hygienic standards in all its processes. It operates together with various distribution networks, from supermarkets to distributors and grocery stores. Its products are also delivered directly to eateries. As such, other than integrator, grower involvements, the moderating effect of managerial skills is just as important but previous researches have not analysed both aspects in the context of

contract broiler business performance within Malaysian poultry environment. In conclusion, this study wills analyses integrator, grower involvement with managerial skills effect of firm's business performance.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes research design methodology, questionnaire development, research ethic and results of pilot study. The survey method has been selected to collect data across Malaysia broiler industries. The research has been designed to support quantitative empirical analysis.

3.2 Overview

This study targets all broiler producers in Malaysia. General approach of this research is quantitative. With regard to the research problem which is to try to study the relationship between Integrator Grower Involvement towards Business Performance and moderating of managerial skills in broiler production; it is performed based on survey strategy and is enjoying of descriptive-analytical method. Statistical population of this research consisted of whole industrial boiler production (producers) that are registered at Department Veterinary Services (DVS) of Malaysia. The main instrument for data collection was a questionnaire including background of the company, integrator and grower involvement specification and managerial questions about broiler production and individual/professional characteristic.

3.3 Research design

In social science study, there are various methods which can be used to examine hypothetical relationship. The following section describes eight research designs that are being used in social science studies namely laboratory experiments, field experiments, survey, case studies, action research, simulation, forecasting and phenomenological studies(Cooper & Schindler, 1998; Galliers, 1992).In laboratory studies, researchers examine independent to dependent variables in a specialized control environment. This method offers excellent control of environment factors but researchers have to be cautious to generalize experimental finding to the real world. Moreover, it is not possible to group entire Malaysia broiler industry studies in laboratory design.

In field design, it is similar to laboratory design where studies conducted on field and through interviews with field practitioners. This is also not possible as companies might not be willing to share business practices openly. Action research also known as collaborative research while researchers participate with the participating subjects to understand and resolve business problems. This provides greater appreciation on the business situations to examine the research framework. However, such research design involves extensive researchers' time and resources. Hence, such research design is isolated to single organization then such choice is not suitable for this study. Methods such simulation and forecasting involve securing cross-sectional data to be simulated and provide a hypothetical relationship test to the environment. Forecasting extends the analytical portion by time series analysis to predict future events. However, both methods are not appropriate to answer the research questions which only require empirical test on the relationship and determinants of the components of integrator-grower involvement,

skill levels and business performance rather than deriving complex mathematical models. Feedback obtained from field practitioners have cautioned that it will be not be possible to obtain enough data to study the variables involved.

Survey method is commonly used in majority of empirical studies Bryman and Bell (2003) explained that survey method incorporates broader population study or larger sample size. It is relatively easy to be administered and incurred moderate cost. Given such advantage, researcher can study more variables. Survey findings can be statistically tested to generalized real world environment. The disadvantage of a survey is potential lack of response from respondents, instruments for test variables are largely based on perception and only cross sectional studies at one point of time. Based on the advantage and disadvantage analysis, survey method has better potential to be used in this study as researcher attempts to understand a broad population of Malaysian broiler industries.

Case studies emphasize full contextual analysis of fewer events or conditions and their interrelations (Eisenhardt, 1991). Although hypotheses are often used in confirmatory statistical analysis in survey, case studies offer valuable insights for problem solving, evaluation and strategy through details secured from multiple sources of information either by secondary data or structure interviews. As a result, data collection and data analysis processes are both subjected to the researchers' influence or subjective interpretation. This method may be bias to the findings and can be considered to supplement case studies where it offers more detail on the subject of analysis (Voss, Tsikriktsis & Frohlich, 2002).

Based on the discussed research methods, the principal method employed in this study is through survey. Zikmund (2003) suggests that there is no one best research methodology

to adopt. Decisions should be based on the trade-off between benefits of the options and the disadvantages. The objective of the research is to determine the relationship of integrator involvement, grower involvement, product modularity, product innovativeness, internal coordination and business performance. Skill level is a moderating variable between independent variables and dependent variable. Pinsonneault and Kreamer (1993) suggest that survey research is best to answer questions on what, how much, how many and lesser extent to answer how and why. Literature review also showed survey is appropriate to examine the all variables and the need of higher number sample size to cover the field in different location in Malaysia. Survey method is the best option as it is cost efficient. It does not involve significant amount of time and also need to have statistically tested validation to close previous research gaps identified from other researchers. Finally, based on the preliminary interview with experienced industry practitioners, the probability of obtaining commitment from business to participate in case study are relatively low making this option not advantageous.

This research considers case study to triangulate areas of research questions which need more contextual confirmation on how and the level of integrator and grower involvement towards business performance. Based on the literature reviews and problem statement illustrated, there are not many research instrument to measure relationship of Integrator-grower involvement towards business performance in agriculture product such as broiler. Hence, specially crafted test instruments through structured questionnaire are used to study the research framework.

3.4 Survey

There are many methods to express the survey to targeted respondents. Phone interview, internet survey, postal survey and e-mail survey have been considered. Sekaran (2003) has demonstrated the best method is situational and no one method is better than others. The first insight, internet survey seems to be an attractive option to reach targeted participants, dynamic and may look impressive. Hence, after having observed the details, it requires investment for information technology hardware such as dedicated servers or confidentiality from learning institution. Furthermore, respondents might escape to response.

Postal survey is less costly as compared to internet survey. Based on previous literature reviews, postal survey has been commonly used in Malaysia. Furthermore, we could predict targeted respondents are familiar and willing to express their view in the survey at their convenience without the existence of the researcher. Theoretically, it is possible to capture data from a large number of individuals from scattered area at different location in Malaysia. Hence, it is much easier and feasible to manage compared to phone interviews which need more man hours and is costly. The main issue with postal survey is very low responses rate as quoted by (Boon-itt & Hamangshu, 2006; Rajagopal, 2006). This impact can only be prevented, not entirely eradicated. The risk mitigation plan is to carefully design the survey questions, layout, keep it attractive, stressing confidentiality, and explain the intention of survey in the separate letter and make allowance for none-response by estimating none-response bias through sampling none-response from the completed sample. Follow-up of the late respondents are carried out by resending reminders through postal survey again or by e-mailing contacts. During this level, e-mail

response might be collected while respondents are given a chance to answer the postal survey or answering through the attached soft copy.

3.5 Population and Sampling Frame

Malaysia's agriculture sector accounted for 14 percent of GDP in 1995, down from 38 percent in 1960 (*Asian Development Bank. Asian Development Outlook 1996 and 1997*, 1996). During the past three decades, the Malaysian poultry industry has evolved from small back-yard operations into relatively modern, large-scale commercial operations. One of the factors contributing to the growth of the poultry sector is the replacement of local breeds with high-quality poultry breeds from the United States, Europe, Canada, and Australia. A second factor is the growth of highly efficient integrated production systems. Six of the largest broiler operations are now fully integrated with breeder farms, feed mills, processing plants, and in some cases, retail outlets. The integrated business account for two-thirds of broiler production in Malaysia and are steadily increasing their market share (Fuglie, 1996). Hence, this sector is logical consideration as the population used for the research.

The Malaysia Department of Veterinary Services (DVS) has been commonly used by various researchers as a data base to select population and sampling frame. Based on literature reviews, quality of respondents is an important factor and is expected to have best knowledge about the operation and management of supply chain in their organization. Hence the survey targets managers in operation, materials planning, marketing, general managers or directors. Sampling frame is a list of population elements

from which a sample can be drawn. Sampling frame should at least meet these criteria (Cooper & Schindler, 1998).

Frame contains a list of members' defined population.

Frame should be up-to-date and complete.

Frame element is unique and not repetitive.

Frame should contain information to stratify the sample.

From literature reviews on manufacturing research done in South East Asia context, the average successful response rate is relatively low, between 15-22% (Boon-itt & Hamangshu, 2006; Thi, 2006). Based on these past experiences, it has been decided to include the entire 1,300 listed contract broiler producers. The objective is to involve all the producers and to ensure sufficient data collection to meet the criteria of good sampling frame and sufficient data to run the statistical analysis (Bryman & Bell, 2003).

3.6 Sampling Method

The purpose of sampling begins with the identification of the population. The population refers to a whole group of people or organization that is of interest to the researcher (Sekaran, 2005). The population of this study has been chosen among businesses who are involved in contract broiler production segment. The reason why this contract broiler production segment was chosen for this study is because there are the broiler producers who were in the highest ranking in the list of businesses who contributed the most chicken meat to the market (MyCC, 2012). The names of the contract producers were derived from data base of Department of Veterinary Services of Malaysia (DVS).

Multi item scales adopted from prior studies for the measurement of the construct were considered for use to test hypotheses. A five-point Likert scales with end points of rating very low (1) and very high (5) were used to measure the items. A brief explanation of the constructs is included in the next section. The Likert scales are psychometric response scale primarily used in questionnaires to obtain participants preferences or degree of agreement with a statements or set of statements (Bertram, 2008). Moreover, Likert scales are a non-comparative scaling technique in nature and uni-dimensional which means that it measures only a single trait. Generally, respondents were asked to indicate their level of agreement with a given statement by approach of an ordinal scale.

The importance of 5-Likert scale had been highlighted because it manages to offer the neutral rating which is 3-point (Canny, 2006). When respondent being provided with neutral midpoint, it will avoid the respondent to bias during decided to choose more positive or more negative response. In some cases, respondent will pull consideration to the negative due to their past experiences. The important message to address here is that survey respondents might truly feel neutral when being given specific topic of interest. Hence, scale with neutral midpoint assists respondents not to be biased.

Suggested by Garland (1991), the presence or omission of a mid-point may contribute to the alteration of the results substantially. Nevertheless, it is still basically depends on the population of the survey. However, with the existent of the mid-point, the most certain becomes the choice of preference among researcher. In this study, the population was from poultry industry; therefore, the mid-points will give roughly some insight to their inclination to the direction of the companies in dealing with their business performance related to their behavior towards integrator and grower involvement.

Next, pilot study was conducted on managerial group including; managing directors, general managers, managers and other managerial positions from 120 contract broiler growers. Corrected item-total correlation was used to filter the scales. An item was excluded if its correlation with the corrected item total was below 0.50. Cronbach's Alpha was used to evaluate the scale reliability. Then alpha values over 0.70 were considered acceptable. Based on the pilot study results, the questionnaire was further revised and made ready for the large scales data collection stage.

Cronbach's alpha determines the level of internal consistency where it explains how close is a set of items in a group. The high alpha value shows a proof that the items being measured are really the ones construct wants to measure. This works along the considerable arguments and with the certain possible statistical measure. In other viewpoint, the high alpha value does not mean that the measure is uni-dimensional. It is recommended to measure internal consistency by looking at scale in the questionnaire. If the scale is uni-dimensional, then only additional analyses can be done. One way to check for dimensionality is through exploratory factor analysis (EFA). In conclusions, Cronbach's alpha is trying to explain the coefficient of reliability (consistency) and it is not a statistical test (SPSS, 2012).

3.6.1 Data Collection

Data collection method used here is the postal survey. First, there is a cover letter to explain the importance and objective of the research in the context of Malaysia supply chain management for poultry industry. The cover letter carried the names of the

academic institution and the signature of the project supervisor. A cover letter is reported to enhance the response rate (Appendix A).

Second, business owner or persons with managerial position were asked to designate the appropriate stakeholder to answer the questionnaire; that could be the general manager or the preferred respondent such as the operation managers. These managers are selected since they are deemed to be engaged directly in contract broiler production and can maximize the validity of the research content.

The problem of lengthy questionnaire should not be overlooked in the data collection activities. The questions have been categorized neatly into sections. Double side printing (booklet style) has reduced the length of survey. Appropriate font size for reading has also been maintained. The front page of the instrument contains some image functions and instructions to ensure professional looks.

The survey packet contained a cover letter as explained early on, the survey instrument brochure and a self-addressed envelope. Self-addressed envelope was used to increase the rate of response. The respondents were given approximately four weeks to respond. Then a follow up mail with a replacement questionnaire was sent to increase the rate of response for those who had not responded; the reconciliation of the survey ended by week eight. The study focused only on the Malaysia livestock for the contract broiler producers. The unit of analysis is at the organization level as the objective of the study is to identify the relationship of integrator and grower involvement on business performance.

A pilot test was conducted to detect any amendments that need to be done to the survey process and item questions. Similar experimental environment has been established to

acquire 30 samples from the field. Based on the pilot test results, modifications were made before the large scale survey was administrated.

A total of 1,100 survey packets were sent to the entire population to increase the data collection rate. The returned questionnaires were sorted into early and late responses over three to four months period. A non-bias response analysis is to be conducted.

3.7 Instrument Development

3.7.1 Design of Questionnaire

This section describes items used to measure the variables of this study. Overall the questionnaire has been categorized into six sections: general information about organization, integrator involvement, grower involvement, managerial skill and business performance and respondent's profile. The dependent or endogenous variable is business performance. The independent or exogenous variables are integrator involvement and grower involvement. The moderating variable is the managerial skills. Table 3.1 illustrates the section of measurement theme, number of questions and the corresponding sources of literature. In general a 5-point Likert scale is being used.

Table: 3. 1
List of Research Variables

Independent Variables		
Variables	**Dimension**	**Sources**
Integrator Involvement (II)	Product Modularity (PM) Product Innovativeness (PI) Internal Coordination (IC)	Lau, (2011) Wynstra & Ten Pierick(2000) Vonderembse & Tracey (1999) van-Echtelt *et al*.(2008) Takeishi (2001) Salavou (2005) Stjenstrom & Bengtsson (2004) Song & Benedetto (2008) Salavou (2004) Ryu, Min, & Zushi (2008) Peter (1996) Avlonitis & Salavou (2007) Danneels & Kleinschmidt (2001)
Grower Involvement (GI)	Grower Involvement in Product Development (CPD)	M.F.Svendsen, *et. al.* (2011) Ragatz *et. al*. (1997) Peterson, Handfield, & Ragatz (2005) Athaide & Klink (2009) Brown & Eisenhardt (1995) Chen, Damanpour, & Reilly (2010) Feng *et al.* (2010)
Moderating Variables		
Managerial Skill (MS)	Planning and Goal Setting Accountancy and Financial Management Skills Marketing Management Skills Information Seeking Skills Decision Making Skill	(Allahyari, Saburi, & Keshavarz, 2011a) Martino & Polinori (2011)
Dependent Variables		
Business Performance (BP)	Business Performance (BP)	Roll (2010) Bhagwat & M.K.Sharma (2007) Agus (2010) Agus (2011) Sanchez & Perez (2005)

Table: 3. 1 (continued)

	Zelbst, Green, & Sower (2009) Zailani & Rajagopal (2005) Zack et al (2009) Yaaghubi, Chizari, Pezshkirad, & Foeli (2009) Worren, Moore, & Cardona (2002a) Webster (2002) Threranuphattana & Tang (2008) Tan, Kannan, &Handfield (1998) Sezen (2008) Saad& Patel (2006) Rosenzweig, Roth, & Jr-Dean (2003)

3.7.2 Structure of Questionnaire

Section 1: General Information. This section collects info on the profiles of the organization related to company ownership, type of company, type of chicken produced, and the respondent's position in the company, number of years organization has been in operation in Malaysia and the size of organization in terms of employees or the sales revenue. The objective of this section is to understand the general profile of the organization.

Section 2: Independent Variable – Integrator Involvements. This section contained items that probe determinants of integrator involvements such as Product Modularity PM), Product Innovativeness (PI) and Internal Coordination (IC). The measurement instruments for product modularity, product innovativeness and internal coordination are the five-point Likert-type measurement scales. The scales were adapted from Lau *et al.* (2010), Narasimhan and Kim (2002), Frohlich and Westbrook (2001). The scales of PM were adapted from recent empirical studies (Lin, 2003; Worren *et al.*, 2002b; and Duray *et al.*, (2000). The scales of PI were adapted from Garcia and Calantone (2002),

Danneelsand Kleinschmidt (2001), Schmidt and Calantone (1998). These scales of the IC were adopted from Narasimhan and Kim (2002), Frohlich and Westbrook (2001).

Section 3: Grower Involvement in Product Development (GI). This section involving growers in new product development requires commitment to the relationship from both grower and integrator. First, business often offer products and services that are perceived by the growers as different from the competitors' offerings (Dickson & Ginter, 1987). Furthermore discuss how grower involvement and specific investments are related to relationship business performance. The variables were measured by multi-item scales and developed the scales based on measures used in previous empirical studies. The grower involvement in product development scale describes the degree to which the grower is involved in product development processes.

Section 4: Moderating Variable, Managerial Skills (MS) - This section is designed to produce information on managerial factor related to farming and competition in the industry. This variable is considered as a moderating variable that influences the adoption of integrator-grower involvement towards business performance.

Section 5: Dependent Variable, Business Performance (BP) - This section has been designed to understand the performance acquired by the organization. The questions have been modified from the past studies by Li, et. al (2006) to be structurally short and precise. This measurement is measured on 5-points Likert scale ranging "Very Low" to "Very High". Measurement for business performance has been extensively modified and cross referenced to available literature reviews.

3.8 Ethics in Data Collection

Suggested by Sekaran (2003) ethics in research consists of moral principles, perceptions and the philosophy of conduct that is being practiced by individuals, groups and professionals. For the researcher, in conducting research they cannot compromise with the respondent's data and confidentiality. Besides that, wording in the survey questions should not give misleading approach or create bias results. Moreover, the survey question must only answer one particular point not multiple points. The researcher should always try to encourage accuracy, objectivity and never conveniently ignore certain aspect of the data analysis just to prove promising arguments (Bryman & Bell, 2003).

In this study, researcher highlights the importance of confidentiality in the very beginning of the survey questionnaire which is on the instruction page. According to Cooper and Schindler (2001) the main objective of the research also comprised in the cover letter for the respondents to be confident with the high level of confidentiality that is being assured. In other words, respondents should be willing to share information in the survey the moment they are willing to answer the survey questions. The researcher expects respondents to be objective to reflect the real situation during the process of answering the survey questions. Apart from that, respondents are required not to be biased according to self-perception or conveniently answer the questions without giving them due opinions.

3.9 Data Analysis

Since data collection reaches to end, the following process is to analyze it using statistical software SPSS Version 19 (Statistical Package for Social Science); Reliability was

conducted on the items measurement. Then Correlation was done to gauge the preliminary results and relationship between variables.

3.9.1 Data Profile

Once the data was collected but before further tests were done on the variables, the data was screened for any errors in coding. Results of the frequency test indicated there were no errors in data entry. There was no extreme minimum or maximum value exceeding the range and the mean was also within the specified range. Thus, it can be concluded that the data was clean. Besides, using a missing value analysis provided by SPSS program, it was systematically assessed on the data entry accuracy or errors. The mean, standard deviation, frequency and histogram were analyzed. All the processed and at every stage, the researcher would get to observe the overall data before detailed analyses. As the response rate did not reach 15% no data was deleted (Meyers, Gamst & Guarino, 2006).

3.9.2 Validity and Reliability Analysis

Exploratory data analysis will be used to examine whether all these data for each item belong to the measures that was assigned (Bryman & Bell, 2003). When comparing between other items that obtain relatively low correlations measurement score, true items will have more variance relating to the common factor among the items. This will contribute more to the measure of reliability. As suggested by Hair, Anderson, Tatham and Black (2009) the most commonly used technique is to consider loading factors that are greater than 0.5.

The most common technique also used is confirmatory factor analysis (CFA) which is a special form of factor analysis that is frequently used in social research (Kline, 2010). It is used to test whether measures of a construct are consistent with a researcher's understanding of the nature of that construct (or factor). Hence, the objective of confirmatory factor analysis is to test whether the data fit a hypothesized measurement model. Preedy and Watson (2009) suggest that, this hypothesized model is based on theory and/or previous analytical research.

3.9.3 Predictive Validity

According to Sekaran (2003), correlation behaves as an indicator of predictive validity and cannot prove causal hypotheses. In short, predictive validity shows how the scores on one instrument relate from one to another. When there is tendency for a relationship to occur, one can assume that the measures of those constructs have certain degree of predictive validity. Furthermore, the predictive validity would be tested using bi-variate correlation test.

3.9.4 Pilot test

The purpose of pilot test is to determine any correction that need to be done to the survey process and items in the set of questions. The test was conducted and based on the results; modifications were made before the large scale survey was administered. A total of 1,100 survey packets were sent to the entire population to increase the response rate. The returned questionnaires were sorted into early and late over four to five months. The total number of companies that operate broiler productions was 1,300, but only 1,100

producers are involved in contract scheme; therefore this number was chosen as the targeted respondents in this study**.**

3.10 Summary

This chapter outlined the methodology used in this study, exploring the relationship between integrator involvement and grower involvement towards business performance. The following area were discussed; population and sample, variables and measures, research question and hypothesis, data collection and analysis and finally the summary. Research on the relationship between integrator involvements, grower involvements moderated by managerial skills towards business performance is very important in supply chain management.

CHAPTER FOUR

FINDINGS AND RESULTS

4.1 Introduction

This chapter elaborates on the findings from the survey conducted. The response rate, profile of respondents, regression and so forth are detailed in the next section. It describes the respondent demographics or profile, a factor analysis and subsequently the resulting dimensions of the relevant variables for this study. This is followed by an analysis using descriptive statistics, correlation and the testing of hypotheses using hierarchical regression analysis. It should be noted that the focus of this chapter is only on a presentation and brief discussion of the results. A thorough discussion related to the main research questions will be presented and elaborated on in Chapter 5.

4.2 Response rate

The first wave of data collection started in February lasting until May 2013. Introductory cover letters, the survey questionnaire and postage paid self-addressed envelopes were mailed to 850 broiler contracts growers starting from May onwards. From the total of 850 questionnaire sent, 230 questionnaires were returned of which only 200 were usable yielding a 23% usable response rate. As suggested by Frohlich (2002), the response rate appeared low compared to the average range of 32% recorded in operation management studies. There has been one study to measure the level of time-manufacturing practices, work system practices, and competitive capabilities of manufacturing firms which

reported a 4.3% (265/6183) response rate (Rondeau, Vonderembse & Ragu-Nathan, 2000). The lower response rate encountered in the present study might be explained by various reasons, for example such as survey fatigue (Klassen & Jacobs, 2001) and Frohlich (2002), the length of survey. The survey exhaustion was due to the many survey forms need to be completed by respondents, according to managers contacted through follow-up calls and emails. There were managers, who responded that they needed to reply to numerous surveys participation requested from others such as, from government agencies and even consultancy firms.

In addition, the length of the survey questionnaire, which was more than ten pages as considered, being too long. According to Roth and Be Vier (1998), the response rate might have been reduced due to length of the questionnaire: "questionnaire length decreased response rate". Table 4.1 below shows the response rate of previous studies which were conducted in Malaysia.

Table: 4.1
Response rate of selected studies in Malaysia

Authors	**Topic studied**	**Level of analysis**	**Respond rate**
Mustaffa, Z., *et.al* (2007)	Strategic roles of foreign multinational subsidiaries in Malaysia.	Mailed to CEO/MD of foreign companies.	Received 112 from 1203 (9%), however only 6% (71) were usable.
Chew, *et al.* (2006)	Technology transfer practices of the High Tech industry.	Used questionnaire and did personal interview with top managers. Chose 10 respondents of each industry.	Respond rate 114 from 120 firms (95%).

Table 4.1 (continued)

Ariffin, N. *et. al* (2004)	Internalization innovative capabilities.	Used three steps: mailed, interview and mailed again to selected firms.	Step one: mailed 200 but received 30 (15%) ; Step two: interviewed 53 firms of which 26 firms from the 30 firms that responded earlier and added another 28 firms then under step three: mailed 53 firms and received 6 (11%).
Abidin, Z. (2004)	Technology transfer and firm-host government.	Used survey.	Received 79 from the JETRO list but only 70 usable. The list was not disclosed.
Lai & Narayanan (1997)	Technology competence in MNCs.	Questionnaires.	Respond rate was 31% (50 firms from 160 firms).
Narayanan & Lai (1993)	Human resource constrains in technology transfer.	Survey.	Mailed to 160 firms, but due to poor response, they did stratified sampling to select 50 firms.

The second wave of data collection was conducted from June to September 2013 due to poor response rate from the first survey. The survey was sent out to another 150 broiler contracts growers randomly selected using the method discussed previously. From the total survey forms sent, 110 were received back but 85 were usable. In total, from the first wave and second wave survey, the total number of response was 285 and there were 55 non-usable questionnaires. The non-usable questionnaires were due to various reasons; businesses refused to participate (25), growers quit from contracts (15) and businesses moved to new location (15). In order to ensure that there was no response bias in the first wave and second wave surveys, Amstrong and Overton's (1997) approach was used and will be discussed in the following section.

Table: 4.2
Response Rate

	Number	(%)
Total response	340	34%
Usable response	285	285/1000=29%
Total non-usable responses	55	
Moved to new location	15	
Refused to participate	25	
Quit from contract	15	
Non-Response	660	66%

4.3 Test of Non-Response Bias

Non-response bias is one of the major apprehensions when conducting survey research. According to Vachon (2003), since the inference about the whole population that made from the sample, non-response bias is able to give a wrong impression dependent on whether the sample is under or over representing one specific segment of the targeted population. Once data had been collected, one of the methods to handle non-response bias is to estimate its effect on the specific variables. Suggested by Amstrong and Overton (1997), the suitable method for estimating the effect of non-response bias is a time extrapolation. An independent sample t-test was conducted to make sure the sample represents the variables.

The mean and standard deviations of all variables for the two groups (early and late responses) were fairly close. The t-test for assumption of equality of variances indicated that all study variables were not significant ($p>0.05$).

Table: 4. 3
Non-Response Bias

Variable	Early response		Late response		t-value
	Mean	SD	Mean	SD	
Business Performance					
Financial	3.69	0.71	4.21	0.42	-4.95
Non-Financial	3.48	0.66	3.56	0.57	-6.31
Integrator Involvement					
Product Innovativeness	3.85	0.92	4.38	0.31	-3.94
Product Modularity	3.59	0.71	4.26	0.51	-6.31
Internal Coordination	3.64	0.74	3.85	0.45	-1.87
Grower Involvement	3.75	0.87	4.24	0.51	-3.76

The independent sample t-test variances of the subgroups of respondents (early and late responses) were generally equal. Since, all variables in the t-test were not significant; therefore, there was no necessity to analyze data from the two groups individually.

4.4 Profile of the respondent

This section elaborates on the characteristics of the organization that became as the respondent in this study. Information that can be retrieved from organization includes personnel position in the company, how long the position was held in the company, how long has the company operated in broiler production, number of employees and the state of the company operating.

The survey questionnaire was directed to the owner, General Manager, Managing Director, Manager, Senior Manager and other managerial positions who knew activities related to broiler contract faming. In term of positions who participated in the survey; explained 64.2% or 183 respondents represented farm owners. General Manager was represented by 1.8% or 5 respondents. Managing Director was only represented by 1.4%

or 4 respondents followed by Managers 5.6% or 16 respondents. Senior Managers and others managerial position being represented by 20.4% or 58 respondents 6.7 %, and 6.7% or 19 respondents.

Figure 4.1 below shows respondents' profile according to their position.

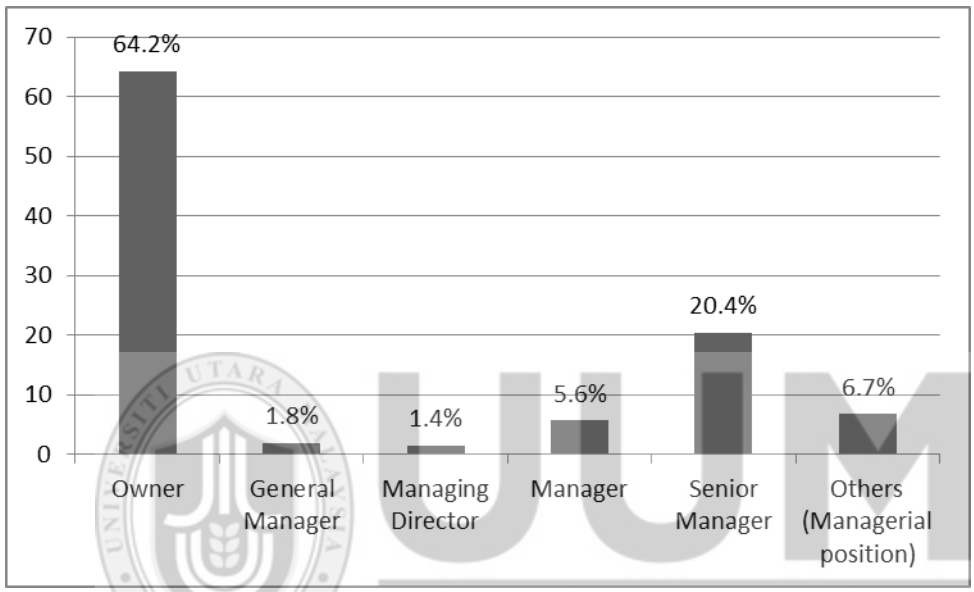

Figure: 4. 1
Bar Chart Shows Respondents Profile According to Their Position

The following item was the numbers of year's respondents were in that position. It was found 26% or, 74 respondents were involved from 1 to 5 years; 38.6% or 110 respondents held their position in the company between 6 to 10 years; while 26.1% or 60 respondents have been in their position between 11 to 15 years. Besides that, 10.9% or 31 respondents were involved in this business for 16 to 20 years. Only 3.5% or 10 respondents were involved in this business more for more than 20 years. Figure 4.2 below shows number of year's respondent in present position.

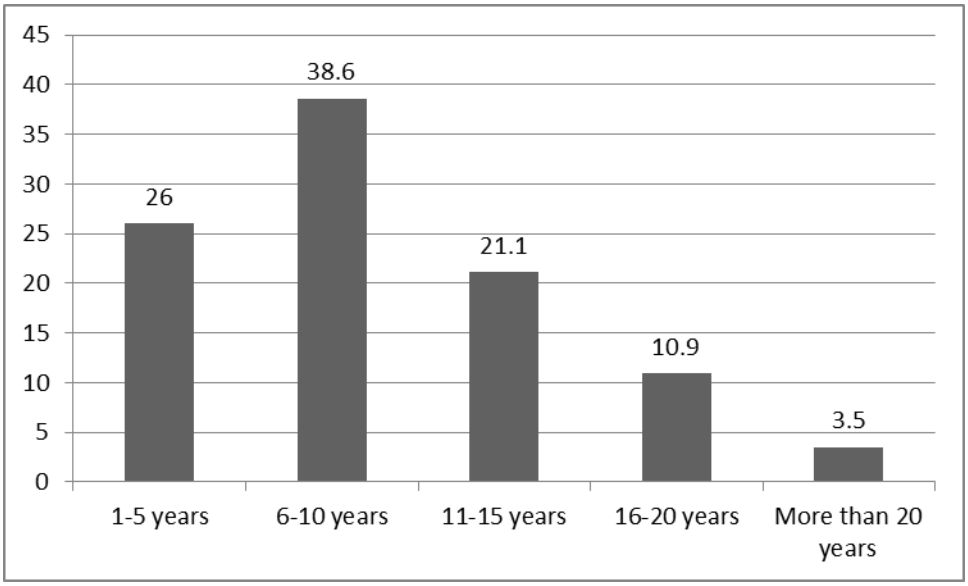

Figure: 4. 2
Bar Chart Shows The Number of Year's Respondents in Present Position

The following item was the duration of the company being operated in this business. It was found 19.3% or 55 companies were involved in broiler production between 1 to 5 years, 37.9% or 108 companies have operated between 6 to 10 years, 27.7% or 79 companies operated between 11 to15 years, 9.8% or 28 companies were involved in this business between 16 to 20 years and only 5.3% or 15 companies operated for more than 20 years. Figure 4.3 below shows the number of year's business operated.

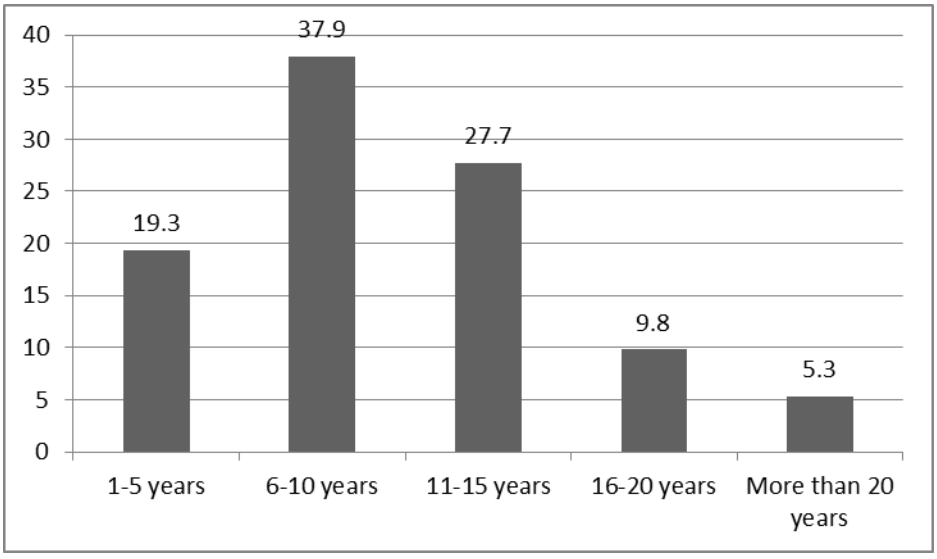

Figure: 4. 3
Bar Chart Shows The number of Year's Business Operated

The next item describes the overall number of employees in the company; 89.5% had less than 50, 6.7% had 50 to 100, 3.2% had 100 to 150 and 0.7% had more than 150 employees.

Figure 4.4 below shows the number of employees in business operation.

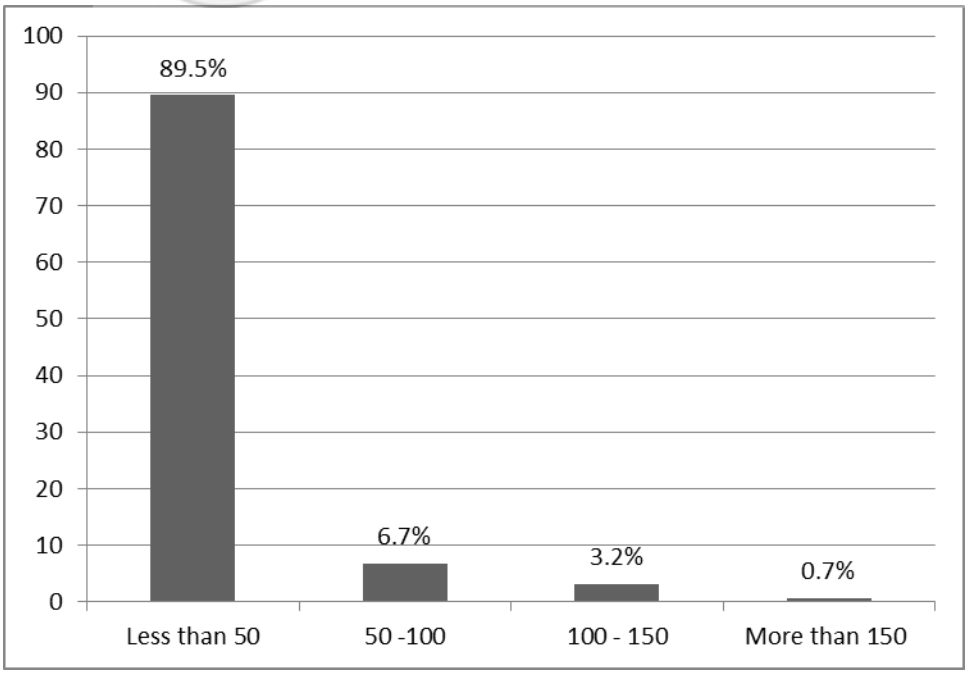

Figure: 4. 4
Bar Chart Shows The number of Employees in Business Operation

Furthermore, a question on ways businesses acquire technology on farming was posed to indicate integrator and grower involvement in broiler contract scheme. In term of housing type; 55.4 % implemented closed house system and 44.6 % still practiced conventional type which is open house system in contract farming. Figure 4.5 below shows the broiler housing type.

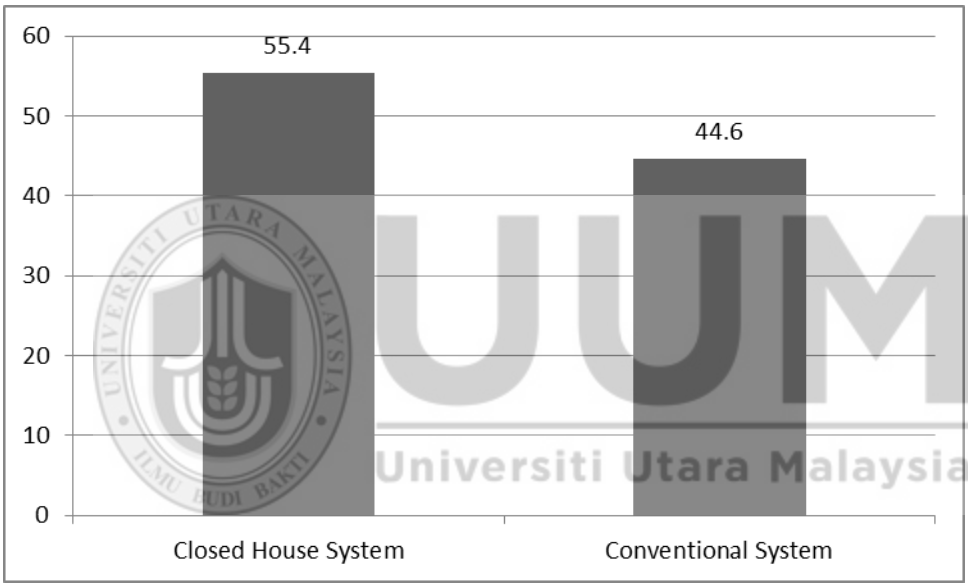

Figure: 4. 5
Bar Chart Shows The Broiler Housing Type

The following item describes the reasons why companies implemented the type of broiler housing; 70.5% or 201 companies followed integrator suggested housing, 27.4% or 78 companies followed government regulation and 2.1% or 6 companies based their housing on low cost for infrastructure. Figure 4.6 below shows the reasons for selecting housing type.

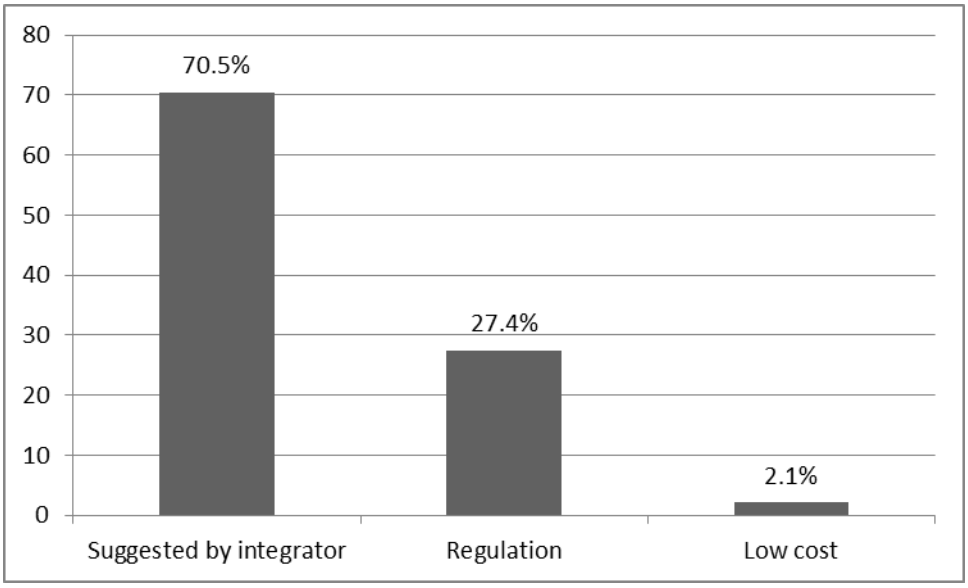

Figure: 4. 6
Bar Chart shows The reason to Select Housing Type

The majority of the businesses that responded were from Kedah 33.3% or 95 companies, followed by Perak 28.1% or 80, Pulau Pinang 14.7% or 42 companies, Negeri Sembilan 14% or 40 companies, Kelantan 5.6% or 16 companies; Melaka and Johor with a response of 1.4% or 4 companies each. Only three states had below one percent respond including; Pahang 0.7% or companies, Selangor and Terengganu responded 0.4% or 1 company each. Figure 4.7 below shows the respondents according to states.

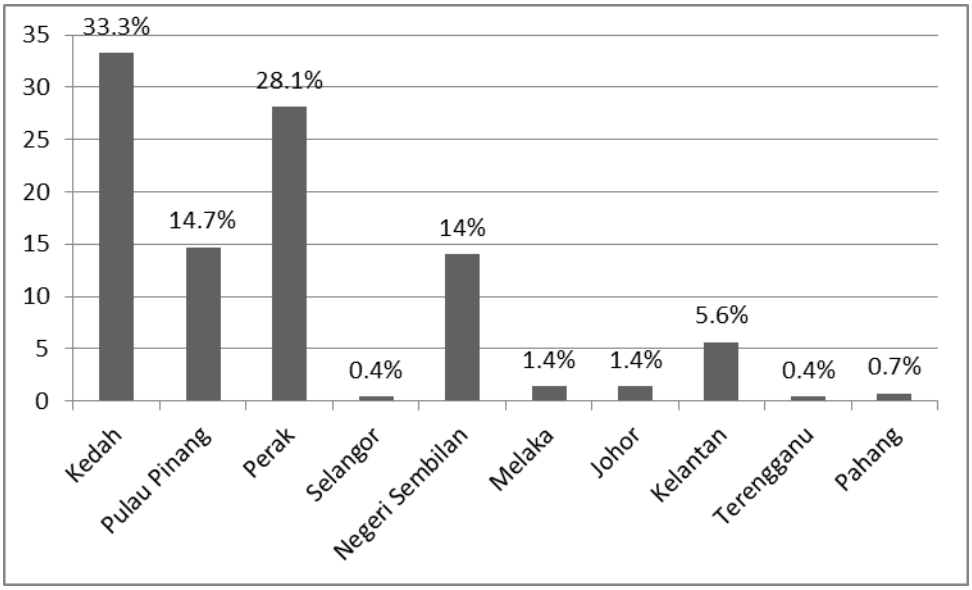

Figure: 4. 7
Bar Chart Shows The Respondents According to States

4.5 Goodness of Measures

Generally, goodness of measures directly refers to the validity and reliability of the measures. Suggested by Cooper and Schindler (2003), the procedures to test the goodness of measures must be applied before analyses have been done; Factor analysis is used to make sure the construct adequacy of a measuring device. This study has applied component analysis (PCA) method with varimax rotation (Hair, Andersen, Tatham & Black, 1998). Moreover, the technique for testing goodness of measures as suggested by Sekaran (2003) were followed; these include factor and reliability analysis. The results of the factor and reliability analysis are presented accordingly.

4.6 Factor Analysis Results

The construct of the questionnaires was subjected to validity and reliability tests. One of alternative in testing the constructs is through factor analysis. The objective is to examine the underlying patterns or relationships for a large number of variables and to determine whether the information can be condensed or summarized in a smaller set of factors or components (Hair, Money, Samouel & Page, 2007). A group of item in needed to explain every item, which represents part of construct. In addition, factor analysis also assists the researcher to select appropriate items to ensure the construct validity exists; based on correlations that exist between items in factor analysis, explains which item in which dimension.

Suggested by Hair (2006), each variable required a minimum of five cases when running factor analysis. However, Gorsuch (1997) proposed that the minimum sample size should be at least 100. The first step in factor analysis is extracting process where the items that represent to measure a variable forming the component. Meanwhile, the second step is rotation process that assist researcher to interpret that simplifies and recognizes more meaningful factor.

In order to ensure the dimension is factorable, a few criteria must be met, which include the significance of Bartlett's test of sphericity to indicate the correlation matrix among the items, and the acceptable level of the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, at more than 0.50 (Hair, Anderson, Tatham & Black, 1998). Item communalities are considered high if they are all .8 or greater, but this is unlikely to occur in real data (Velicer & Fava, 1987). More common magnitudes in the social sciences are low to moderate communalities of .40 to .70. If an item has a communality

of less than .40, it may either; a) not be related to the other items, or b) suggest an additional factor that should be explored. The researcher should consider why that item was included in the data and decide whether to drop it or add similar items for future research. (Note that these numbers are essentially correlation coefficients, and therefore the magnitude of the loadings can be understood similarly).

A few previous researchers also had been disputed on criteria when selecting an appropriate item to represent the component. For instances, Kim and Mueller (1978) recommended that each of factor should at least load three items. Each of loading levels explains different levels of variance. As the minimum level of significance at ±0.30, only can explains 10 percent of the variance, while at ±0.50, the loading only can be explained by 25 percent of the variance. Further, the explanation of 50% of the variances can be attained when the loading was above ±0.70.

Comrey and Lee (2002), also proposed that loading at 0.71 was considered excellent, 0.63 was very good, 0.45 was fair and 0.32 was poor. According to them loading in excess of 0.71 indicates 50% overlapping variance, 0.63 has 40% overlapping variance and 30% overlapping variance for 0.55 loading. In addition, Hair *et al.* (2007) suggested that to gain a power level of 80 percent with significance level of 0.05 percent, the loading also should be based on sample size.

As an objectives of factor analysis to condense or summarize the information into smaller set of factors, this research follows (Hair *et al.,* 2007) suggestion to delete each of the items from the construct, which has loading below 0.55.

4.6.1 Business Performance (BP)

Table 4.4 shows the result of factor analysis for business performance. The total items measuring these dimensions were 12. However, after considering all the criteria discussed before, the factor analysis produced two factors. Three items were deleted because they failed to meet the criteria mentioned above. All items had factor loadings above .50 on two factors and .35 or lower on the other factor.

The factor analysis indicates that all the variables fall under two components. Three reductions of items occurred because they failed to fulfil the requirement of .5. These shows 11 items are valid and reliable.

Table: 4. 4
Full Items Under Dependent Variable

Dependent Variable	
Financial	
EBP58	Low cost of quality (inspection) as percentage of total sales
EBP59	Low cost of production per unit
EBP60	Sales revenue
EBP61	Profitability.
EBP62	Return on investment (ROI)
Non-Financial	
ENF63	Delivery speed and reliability (Timeliness of delivery).
ENF64	Short production cycle time.
ENF65	Small defect and low rework rate.
ENF66	Low employee turnover rate
ENF67	Customer returns due to bad quality
ENF68	Low customer complaints rate
ENF69	Product reliability of this company
ENF70	Retained of customers
ENF71	Customer relations
ENF72	Employee morale

Table: 4. 5

The Rotated Component Matrix of All questions Under Business Performance (Factor loadings below 0.60 were not shown)

Rotated Component Matrix[a]

	Component		
	1	2	3
EBP62	.837		
EBP59	.817		
EBP58	.815		
EBP60	.779		
EBP61	.721		
ENF70		.737	
ENF65		.726	
ENF69		.726	
ENF63		.692	
ENF64		.690	
ENF71		.622	
ENF67			.936
ENF68			.929

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Table: 4. 6

Deleted Items of the Dependent Variable (Non-Financial)

Dependent Variable	
Financial	
Non-Financial	
ENF66	Low employee turnover rate
ENF67	Customer returns due to bad quality
ENF68	Low customer complaints rate
ENF72	Employee morale

Table: 4. 7
Summary Factor Analysis of the Dependent Variable

	Variable	***Loadings***
	Business performance	
	Financial	
EBP62	Return on investment (ROI)	.837
EBP59	Low cost of production per unit	.817
EBP58	Low cost of quality (inspection) as percentage of total sales	.815
EBP60	Sales revenue	.779
EBP61	Profitability.	.721
	Eigen-value	41.06%
	Variance	27.93%
	Reliability	.891
	Non-Financial	
ENF70	Retained of customers	.737
ENF65	Small defect and low rework rate.	.726
ENF69	Product reliability of this company	.726
ENF63	Delivery speed and reliability (Timeliness of delivery).	.692
ENF64	Short production cycle time.	.690
ENF71	Customer relations	.622
	Eigen-value	14.97%
	Variance	25.48%
	Reliability	.820

The Eigen-values for factor was greater than one. The Kaiser-Meyer-Olkin (KMO) value and Bartlett's test of sphericity was significant. The one factor extracted from the factor analysis was named business performance (BP). Total items for business performance variable is 15, of which; 5 items represented financial dimension and 10 items represented non-financial dimension. After factor analysis; all items under financial dimension are valid and reliable. For non-financial dimension, there were 4 items that had been deleted from the list due to low loading factor.

4.6.2 Product Innovativeness (PI)

Integrator involvement in product innovativeness (PI) had one dimension. The total items measured were 8; this dimension was analyzed using factor analysis to check for their validity. Using most of the criteria discussed before, the analysis extracted one dimension. In the process of getting this one dimension, 5 items had to be removed due to low communality value.

Table 4.8 presents the result of factor analysis for independent variable of the study, while Appendix 2 shows the SPSS output for the analysis. Based on the factor analysis above, it can be concluded that all items do not fulfil .50 requirements. The items are shown below:

Table: 4. 8
Items Under Product Innovativeness

PI1	Produced birds such as new breed or different breed are a necessity.
PI2	Produced new birds to your customer from time to time are very important
PI3	Created new method to marketing system for broiler is a crucial.
PI4	Created new technology how to grow broiler from time to time are very important
PI5	Created new processed growing technology for broiler farming in industry is necessity.
PI6	Always created new products technology in order to produce broiler.
PI7	Birds are the first new breed on the market.
PI8	Believed that a new breed bird has ability to explore new market places in broiler industry.

4.6.3 Product Modularity (PM)

The second independent variable was integrator involvement in product modularity which consists of 5 items. Based on the factor analysis in Table 4.10, items number PM1, and PM2 were deleted because they did not fulfil the requirement of .50. The retained items included; all broiler parts can be reused in various products, broiler has high degree component carry over, and broiler's components are standardized.

Table: 4. 9
Items under Product Modularity

PM1	Like the other Product, broiler also can be separate into parts such as special cutting.
PM2	Broiler can be produced according size and weight that required without make changes in the feeding composition
PM3	All broiler parts can be reused in various products.
PM4	Broiler has high degree component carry over.
PM5	Broiler's components are standardized.

Therefore, by using only 3 items out of 5 items is good enough to answer the whole dimension of integrator involvement in product innovativeness. The three of the items sit accordingly in factor one with factor loadings more than .5. It can be concluded all the items fall under one factor.

Table: 4. 10
Result of the Factor Analysis for Integrator Involvement in Product Modularity

Rotated Component Matrix[a]

	Component			
	1	2	3	4
PM3				.815
PM5				.664
PM4				.647

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

The Eigen-values for factor was greater than one. The Kaiser-Meyer-Olkin (KMO) value and Bartlett's test of sphericity was significant. The one factor extracted from the factor analysis was named integrator involvement in product modularity. There were two items under product modularity that were deleted as below:

PM1 Like the other Product, broiler also can be separate into parts such as special cutting.

PM2 Broiler can be produced according size and weight that required without make changes in the feeding composition

There were two items under product modularity that were retained as below:

PM3 All broiler parts can be reused in various products.

PM4 Broiler has high degree component carry over.

PM5 Broiler's components are standardized.

4.6.4 Internal Coordination (IC)

The third independent variable is integrator involvement in internal coordination and consists of 9 items. Based on the factor analysis in Table 4.12, items number PI1 and PI6 were deleted because they did not fulfil the requirement of .50. The retained items include; integrator and grower always share the data, integrator and grower always practice teamwork, implement activities together and display close coordination. They were also; implementing close coordination in product design and development, were having interactive system between production division and sales division, were having close coordination in product launching, and integrated inventory management.

Therefore, by using only 7 items out of 9 is good enough to answer the whole dimension of integrator involvement in internal coordination. The 8 of the items sit accordingly in factor one with factor loadings more than .5. It can be concluded all the items fall under one factor.

Items under IC

Table: 4. 11
Items under Internal Coordination

IC1	Integrator and grower always conducted periodic interdepartmental meetings
IC2	Integrator and grower always sharing the data
IC3	Integrator and grower are always practiced teamwork
IC4	Implementing activities together and close coordinated.
IC5	Implementing close coordination in product design & development.
IC6	Practicing information integration in production process
IC7	Has interactive system between production division and sales division
IC8	Has close coordination in product launching.
IC9	Has Integrated inventory management.

Table: 4. 12
Result of the Factor Analysis for Integrator Involvement in Internal Coordination

Rotated Component Matrix

	Component			
	1	2	3	4
IC5	.777			
IC2	.762			
IC7	.753			
IC4	.736			
IC3	.734			
IC8	.727			
IC9	.720			

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

The Eigen-values for factor was greater than one. The Kaiser-Meyer-Olkin (KMO) value and Bartlett's test of sphericity was significant. The one factor extracted from the factor analysis was named integrator involvement in internal coordination (IC).

There were two items under internal coordination that were deleted as below;

IC1 Integrator and grower always conducted periodic interdepartmental meetings.

IC6 Practicing information integration in production process.

4.6.5 Grower Involvement (GI)

The fourth independent variable is grower involvement and consists of 5 items. The total items measuring these dimensions were 5. However, after considering all the criteria discussed before, the factor analysis produced only one factor. Based on the factor analysis it shows the result of factor analysis for grower involvement that retained 4 items; one item which is GI1 was deleted because it did not meet the criteria mentioned above. As shown in Table 4.5, all items had factor loadings above .50. This shows that all the items are valid and reliable.

Table: 4. 13
Result of the Factor Analysis for Grower Involvement

Rotated Component Matrix[a]

	Component			
	1	2	3	4
GI3		.815		
GI2		.803		
GI4		.781		
GI5		.774		

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

The Eigen-values for factor was greater than one. The Kaiser-Meyer-Olkin (KMO) value and Bartlett's test of sphericity was significant. The one factor extracted from the factor analysis was named grower involvement (GI). One item which is GI1 was deleted because it did not fulfil the requirement of .50. The factor was defined by 4 items related to grower involvement. It includes; joint process engineering (e.g. drinking system), joint production operation, joint marketing method (e.g. grade and price), and Joint transport

information (e.g. own transport, outsourced).There is one item under grower involvement that was deleted as below;

GI1 Agreement on poultry production.

Table: 4.14
Summary Factor Analysis of The Independent Variable

	Variable	***Loadings***
	Integrator Involvement in Internal Coordination	
IC5	Implementing close coordination in product design & development.	.777
IC2	Integrator and grower always sharing the data	.762
IC7	Has interactive system between production division and sales division	.753
IC4	Implementing activities together and close coordinated.	.736
IC3	Integrator and grower are always practiced teamwork	.734
IC8	Has close coordination in product launching.	.727
IC9	Has Integrated inventory management.	.720
	Eigen-value	47.13%
	Variance	25.32%
	Reliability	.910
	Grover Involvement	
GI3	Joint production operation.	.815
GI2	Joint process engineering (e.g. drinking system)	.803
GI4	Joint marketing method (e.g. grade and price)	.781
GI5	Joint transport information (e.g. own transport, outsource)	.774
	Eigen-value	9.63%
	Variance	18.50%
	Reliability	.903
	Integrator Involvement in Product Innovativeness	
PI3	Created new method to marketing system for broiler is a crucial.	.849
PI4	Created new technology how to grow broiler from time to time are very important	.723
PI2	Produced new birds to your customer from time to time are very important	.717
	Eigen-value	7.33%
	Variance	14.52%
	Reliability	.826
	Integrator Involvement in Product Modularity	
PM3	All broiler parts can be reused in various products.	.815

Table 4.14 (continued)

PM5	Broiler's components are standardized.	.664
PM4	Broiler has high degree component carry over.	.647
	Eigen-value	6.46%
	Variance	11.22%
	Reliability	.685

4.6.6 Managerial Skills (MS)

Table 4.16 shows the results of factor analysis for managerial skills (MS). At the beginning, the moderating variable was measured by 30 items in one dimension. Based on the factor analysis in

Table: 4. 15
Items under Moderator Variable

Managerial Skills	
	Planning and goal setting skills
DGM1.1	Predicting the required inputs rate over a period of production
DGM1.2	Ability to develop production program and to identify production targets in the short and long term.
DGM1.3	Having a program for hard and difficult conditions and following it.
DGM1.4	Predicting and estimating production costs over a production period
DGM1.5	Predicting and estimating production rates over a production period.
DGM1.6	Predicting and estimating the income from production over a production period
	Accountancy and financial management skills
DGM2.1	Ability to record the activities in broiler production period.
DGM2.2	Ability to record consumed inputs in broiler production
DGM2.3	Ability to record and calculate the amount of initial capital in broiler production.
DGM2.4	Ability to record and calculation of profit and loss in broiler production
DGM2.5	Ability to use a good and effective accounting system
DGM2.6	Continuing education to improve financial managerial skill.
DGM2.7	Ability to effectively use of financial and credit from various sources.
DGM2.8	Ability to purchase needed inputs to enjoy discount prices.
	Marketing management skills
DGM3.1	Ability to choose the best time to sell the product
DGM3.2	Familiarity with the modern style of packaging products
DGM3.3	Ability to analyze demand, supply and price of broiler
DGM3.4	Familiarity with the role of cooperatives in direct sales of products
DGM3.5	Ability to analyze government policy on broiler market.
DGM3.6	Ability to supply product directly to consumers (rather than selling to slaughterhouse)
	Information Seeking skills
DGM4.1	Ability to find for new and better way to improvements
DGM4.2	Ability to collect information about new production technologies
DGM4.3	Ability to collect information on inputs, prices, and market
DGM4.4	Ability to collect information about government policies on the market

Table: 4.15 (continued)

	Decision making skills
DGM5.1	Ability to make decision about technologies to used or be accepted
DGM5.2	Ability to effective use from livestock advisors (economical, veterinary, nutrition, etc.)
DGM5.3	Ability to use best management operations broiler production units
DGM5.4	Ability to take right decisions about time or acceptance of new technologies
DGM5.5	Ability to quickly identify and correct farming problems and the principles to solve the problems
DGM5.6	Ability to rapid analyzing of situations which are not accounted before

Table: 4. 16

Result of the Factor Analysis of Managerial Skills

Rotated Component Matrix

	Component		
	1	2	3
DGM4.2	.820		
DGM5.3	.792		
DGM3.5	.766		
DGM4.4	.765		
DGM4.1	.759		
DGM5.4	.755		
DGM5.2	.751		
DGM3.6	.751		
DGM5.1	.747		
DGM4.3	.722		
DGM5.5	.622		
DGM2.1		.881	
DGM2.2		.856	
DGM2.3		.822	
DGM2.4		.795	
DGM2.5		.631	
DGM1.3			.811
DGM1.2			.777

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table: 4. 17
Deleted Items of the Moderator Variable

Moderator	
Managerial Skills	
	Planning and goal setting skills
DGM1.1	Predicting the required inputs rate over a period of production
DGM1.2	Ability to develop production program and to identify production targets in the short and long term.
DGM1.3	Having a program for hard and difficult conditions and following it.
DGM1.4	Predicting and estimating production costs over a production period
DGM1.5	Predicting and estimating production rates over a production period.
DGM1.6	Predicting and estimating the income from production over a production period
	Accountancy and financial management skills
DGM2.6	Continuing education to improve financial managerial skill.
DGM2.7	Ability to effectively use of financial and credit from various sources.
DGM2.8	Ability to purchase needed inputs to enjoy discount prices.
	Marketing management skills
DGM3.1	Ability to choose the best time to sell the product
DGM3.2	Familiarity with the modern style of packaging products
DGM3.3	Ability to analyze demand, supply and price of broiler
DGM3.4	Familiarity with the role of cooperatives in direct sales of products
	Information Seeking skills
DGM5.6	Ability to rapid analyzing of situations which are not accounted before

Table 4.18 shows the result of factor analysis for managerial skills. The total items measuring these dimensions were 30. However, after considering all the criteria discussed before, the factor analysis produced three factors. Besides that, 11 items represented decision making skills dimension and 5 items represented accountancy and financial management skills. The rest, 14 items were deleted because they failed to meet the criteria mentioned above. As shown in Table 4.7, all items had factor loadings above .50 on three factors. These shows 16 items are valid and reliable. The Eigen-values for factor was greater than one. The Kaiser-Meyer-Olkin (KMO) value exceeding the benchmark value of 0.60, this implied that, the sample size is adequate for factor analysis to be conducted. Also, the ratio of the sample size to the number of items is sufficient for factorability. On the other hand, the Bartlett's test of sphericity is statistically significant, supporting the factorability of the correlation matrix, as the p-value is 0.00. This

indicated the adequacy of applying the factor analysis. The three factors extracted from the factor analysis were named managerial skills (MS).

Table: 4. 18
Factor Analysis of the Moderator Variable

Variable	***Loadings***
Managerial Skills	
Decision making skills	
Ability to analyze government policy on broiler market	.777
Ability to supply product directly to consumers (rather than selling to slaughterhouse)	.751
Ability to find for new and better way to improvements	.759
Ability to collect information about new production technologies	.824
Ability to collect information on inputs, prices, and market	.716
Ability to collect information about government policies on the market	.765
Ability to make decision about technologies to used or be accepted	.739
Ability to effective use from livestock advisors (economical, veterinary, nutrition, etc.)	.761
Ability to use best management operations broiler production units	.796
Ability to take right decisions about time or acceptance of new technologies	.754
Ability to quickly identify and correct farming problems and the principles to solve the problems.	.629
Eigen-value	9.00
Variance	52.95%
Reliability	.947
Accountancy and Financial Management Skills	
Ability to record the activities in broiler production period	.885
Ability to record consumed inputs in broiler production	.879
Ability to record and calculate the amount of initial capital in broiler production.	.825
Ability to record and calculation of profit and loss in broiler production	.785
Eigen-value	2.21
Variance	13.04%
Reliability	.912
Planning and Setting Goal Skills	
Ability to develop production program and to identify production targets in the short and long term	.788
Having a program for hard and difficult conditions and following it.	.808
Eigen-value	1.02
Variance	5.99%
Reliability	.670

In summary, Table 4.19 shows the dimensions derived after factor analysis. Since the result of factor analysis reduced some of the dimensions and required other dimensions to be renamed, the previous hypotheses needed to be amended.

Table: 4.19
The Dimensions Discovered Before and After Factor Analysis

Before factor analysis	**After factor analysis**
Independent Variable	**Independent Variable**
Product Innovativeness	*Product Innovativeness*
Product Modularity	*Product Modularity*
Internal Coordination	*Internal Coordination*
Grower Involvement	*Grower Involvement*
Moderator	
Managerial Skills	*Managerial Skills*
Planning and goal setting skills	Accountancy and financial management skills
Accountancy and financial management skills	Decision making skills
Marketing management skills	
Information Seeking skills	
Decision making skills	
Dependent Variable	**Dependent Variable**
Financial	*Financial*
Non-Financial	*Non-Financial*

4.6.7 Factor Analysis Summary

The reliability test for each dimension emerged after factor analysis was performed. Table 4.5 shows the results of factor analysis summary. The Cronbach's alpha coefficient is a widely adopted measure of reliability. A value of 0.7 in the Cronbach's alpha is considered adequate to ensure reliability of the internal consistency of the questionnaire (Nunnally, 1978). As shown previously, all values exceeded the cut-off point. Therefore, the scales were satisfactory for subsequent analysis. Note that there were few items that had been deleted.

4.7 Reliability Test

The purpose of this reliability analysis is to ensure internal consistency of measurements of the items. The scale internal consistency becomes an issue when the items that make up the scale hang together or not (Pallant, 2001). The most common indicator of internal consistency is Cronbach's Alpha coefficient. Ideally, the Cronbach's Alpha of a scale should be 0.7 (Nunnaly, 1978). Table 4.20 below shows the Cronbach's Alpha for each variable under study and explained index had high reliability.

Table: 4. 20
Cronbach's Alpha for Each Variable under Study

Type of variable	Dimension	No. of Items	Reliability Test-Cronbach's Alpha
Dependent Variable	Business Performance		
	Financial	5	0.891
	Non –Financial	6	0.820
Independent Variable	Product Innovativeness	3	0.826
	Product Modularity	3	0.685
	Internal Coordination	7	0.910
	Grower Involvement	4	0.903
Moderator Variable	Accountancy and Financial Management Skills	5	0.892
	Decision Making Skills	6	0.942

As shown in the table above, all of the variables have fulfilled the requirement when the value of Cronbach's Alpha for each dimension is more than .70. This indicates that all of the items in this study are reliable.

4.8 Normality Test

This test is used to determine whether a data set is well-modelled by a normal distribution or not, or to compute how likely the fundamental random variable is to be normally distributed. In order to determine the data normality statistically; in this study the normally distributed data will be determined by skewness and kurtosis value. Suggested by (Pallant, 2001, p. 54), normality can be assessed to some extent by obtaining skewness and kurtosis value of the variables. The variable was considered normally distributed, if the skewness value was below than 2.0 and kurtosis value below than 7.0 (Cohen & Cohen, 1983). Based on the performance of normality assessment tables, the researcher concluded that all constructs in the research variables have a skewness value lower than 2.0 and kurtosis value smaller than 7.0. Overall, all the variables were distributed under the normal data. Table 4.21 below shows the result from normality test that has been conducted for all variables.

Table: 4.21
Normality Assessment

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Product Innovativeness	285	1	5	3.96	0.83	-0.94	0.14	0.76
Product Modularity	285	1.33	5	3.72	0.69	-0.48	0.14	0.69
Internal Coordination	285	1.57	5	3.69	0.68	-0.3	0.14	0.06
Grower Involvement	285	1	5	3.85	0.81	-0.92	0.14	1.34
Business Performance (Finance)	285	1.8	5	3.79	0.66	0.05	0.14	-0.21
Business Performance (Non-Finance)	285	2.33	5	3.88	0.59	0.03	0.14	-0.46
Accountancy and Financial Mgt. Skill	285	1.8	5	4.08	0.68	-0.78	0.14	0.36
Decision Making Skill	285	1.64	5	3.67	0.68	-0.57	0.14	0.04

4.8.1 Descriptive Analysis of Variables

Mean for product innovativeness recorded a value of 3.96 reflecting that the respondents agreed that creating new method to marketing system for broiler is crucial. Besides, creating new technology for how to grow broiler from time to time are very important and producing new birds to your customer from time to time are very important. Meanwhile, product modularity indicated a mean value of 3.72. Most of the respondent practiced modularity concept for broiler production. It includes; all broiler parts can be reused in various products, broiler's components are standardized and broiler is also like others manufacturing products, which has high degree of component carry over. Next variable is grower involvement that focuses on mutual understanding of broiler farming operation between growers and integrators. It shows very convincing mean value of 3.85 that indicated respondents agreed to the importance of joint production operation such as joint marketing method (e.g. grade and price) and joint transport information (e.g. own transport, outsourced).

Additionally, business performance (financial) indicated mean value of 3.79; that shows respondents agreed and were concerned for the elements such as return on investment (ROI), low cost of production per unit, low cost of quality control (inspection) as percentage of total sales, sales revenue and profitability aspects. Meanwhile, business performance (non-financial), the mean value was 3.88; it indicates respondents are more concerned of farming technical components in order to perform better. The important elements included; retention of customers (growers), small defects and low reworks rate, product reliability of this company, delivery speed and reliability (timeliness of delivery), short production cycle time, and customer relations.

The following is moderator; the first variable is accountancy and financial management skill for which the mean value is 4.08, the highest among the all variables. It shows the respondents agreed to the importance of accountancy and financial management skill. The elements comprised; ability to record the activities in broiler production period, ability to record consumed inputs in broiler production, ability to record and calculate the amount of initial capital in broiler production, ability to record and calculate profit and loss in broiler production and ability to use a good and effective accounting system. The second variable under moderator is decision making skill that indicated mean value 3.67. This shows respondents agreed that the role of decision making is important for broiler farming. It includes; ability to collect information about new production technologies, ability to use best management operations broiler production units, ability to analyze government policy on broiler market. Moreover; ability to collect information about government policies on the market, ability to find new and better way to improve, ability to take right decisions about time or acceptance of new technologies, ability to effectively use livestock advisors help (economical, veterinary, nutrition, etc.). Besides that, ability to supply product directly to consumers (rather than selling to slaughterhouse), ability to make decision about technologies to used or be accepted, ability to collect information on inputs, prices, and market, ability to quickly identify and correct farming problems and the principles to solve the problems.

4.8.2 Linearity and Homoscedasticity

The linearity of the relationship between dependent and independent variables represent the degree to which the change in dependent variable is associated with independent

variables. A scatter plot is a good test for judging how well a straight line fits the data. While homoscedasticity refers to the assumption that the dependent variable being explained in the dependent relationship should not concentrate in only a limited range of independent value. Homoscedasticity was used to verify through the scatter plot of the regression standardized residual versus regression standardized predicted values.

4.8.3 Autocorrelation

The Durbin-Watson coefficient, (d) was conducted to test the autocorrelation of the model (Cohen & Cohen, 1983). The rule of thumb defined that the values of d range from 0 to 4. Values close to 0 indicate extreme positive autocorrelation; close to 4 indicate extreme negative autocorrelation; and close to 2 indicate no serial autocorrelation. As a rule of thumb, d should be between 1.5 and 2.5 to indicate independence of observations (Cohen & Cohen, 1983).

4.8.4 Multicollinearity

According to Coakes (2005), multicollinearity refers to high correlation among the independent variables, whereas singularity occurs when perfect correlation among independent variables exist. The simplest technique to identify co-linearity is an examination of the correlation matrix for the independent variables. The high correlation generally of 0.90 and above is the first indication of substantial co-linearity (Hair et al., 2006). In addition, the tolerance and variance inflation factor (VIF) value will also be calculated for each independent variable by selecting collinearity diagnostics. Tolerance test is carried out for each independent variable. According to Hair *et. al*, (2006), a common cut-off threshold is a tolerance value of 0.10, which corresponds to a VIF value

of above 10.Verifying the multicollinearity problem can be done through bivariate correlation for all of the independent variables. In this study, multicollinerity has been examined between independent variables using Pearson's correlation.

4.8.5 Homoscedasticity

According to Norusis (1999) generally it refers to the moment when there is no pattern to the data distribution, and residuals are scattered randomly around the horizontal line through 0. The assumption of homoscedasticity requires that the variance of the error term (Hair, Black, Babin & Anderson, 2010). Moreover, it appears that the homoscedasticity assumption for the other variable was not violated.

4.9 Correlation Analysis

A correlation analysis was carried out to describe the relationships among all the variables. The correlation analysis was conducted prior to hypothesis testing in order to determine the extent degree to which they are related. Once two or more independent variables are highly correlated, the determination of important predictors becomes confused. Subsequently, multicollenearity increases the variance of regression coefficients and fearful the validity of the regression equation. As noted by (Allison, 1999; Meyers *et al.,* 2006) the values of Pearson's correlation show the relationship between independent variables, and it is one of the methods for multicollenerity diagnostics. Then supported by (Hair *et al.,* 2010), there is no definitive criterion for the level of correlation that constitutes a severe multicollinearity problem. Suggested by Cramer (1998), a correlation value in the range of 0.4 to 0.6 is considered moderate and a higher value (more than 0.7) is considered to indicate a strong correlation.

Table: 4. 22
The Mean and Standard Deviation of The Major Variables

Variables	Mean	Std. Deviation
Business performance (Financial)	3.79	0.66
Business performance (Non-Financial)	3.88	0.59
Product Innovativeness	3.96	0.83
Product Modularity	3.72	0.69
Internal Coordination	3.69	0.68
Grower Involvement	3.85	0.81
Accounting and financial management skill	4.08	0.68
Decision making skill	3.67	0.68

In term correlation of integrator involvement (product innovativeness, product modularity and internal coordination); indicated that there was a significant positive relationship with business performance. Relationship with business performance (financial); product innovativeness ($r = 0.42$, $p<0.01$), product modularity ($r = 0.50$, $p<0.01$), internal coordination ($r = 0.51$, $p<0.01$), and grower involvement ($r = 0.43$, $p<0.01$). Besides that, relation with business performance (non-financial); product innovativeness ($r = 0.66$, $p<0.01$), product modularity ($r = 0.48$, $p<0.01$), internal coordination ($r = 0.54$, $p<0.01$), and grower involvement ($r = 0.59$, $p<0.01$).

The correlations shown between independent and dependent variables offer initial support for the hypotheses tested in this study. Moreover, the correlation coefficient 'r' indicated the strength of relationship between two variables. However, as suggested by (Sekaran, 2003), how much variance there is in the dependent variables need to be explained and the independent variables are tested simultaneously. Consequently, analysis must be carried out using multivariate analysis with multiple regression analysis. This study specifically used hierarchical regression analysis in order to examine the moderating effect of the managerial skill on the relationship between independent and

dependent variables. Table 4.23 below show all correlation summaries between independent and dependent variables.

Table: 4. 23
Correlation of Independent Variable and Dependent Variables

	B.P (Financial)	B.P (non-Financial)	PI	PM	IC	GI
B.P (Finance)	1					
B.P (non-Finance)	0.511**	1				
PI	0.420**	0.666**	1			
PM	0.509**	0.486**	0.506**	1		
IC	0.512**	0.548**	0.568**	0.462**	1	
GI	0.433**	0.591**	0.580**	0.482**	0.601**	1

**p<0.01 (2-tailed); *p<0.052-tailed)

Overall, the above results identified the relationship between each of the variables and allowed the study to conclude as to whether there is enough evidence to accept the null hypothesis or there is not enough evidence to reject the null hypothesis.

4.10 Multiple Regression Analysis: Hierarchical Regression

To examine the hypothesis of this study, four step hierarchical regressions has been done; Among authors who recommend using Hierarchical Regression in research with moderator variable detection are, (Aiken & West, 1991; Stone-Romero & Hollenbeck, 1984). Other authors, such as Baron and Kenny (1986) suggest that moderating effect can be tested using multiple regression. First step, the control variables size and capacity utilisation were included to regress with the dependent variable. Second step, independent variables and control variables were regressed with the dependent variable. Third step, the moderator was included; decision making skill, accountancy and financial management skill were regressed with the dependent variable. Lastly, the control

variables, independent variables, moderator and interaction of moderator, decision making skill, accountancy and financial management skill and independent variables were regressed with the dependent variable. Nevertheless, before more analysis could proceed, multiple regressions were tested accordingly. Multiple regressions depend on main assumptions to be fulfilled: as suggested by Hair *et. al.*,(1998) the assumptions include; normality, linearity, independence of residuals and homoscedasticity and these were tested accordingly.

4.10.1 Multiple Regression Analysis Assumption

As discussed earlier, regression can be used while the assumptions need to be fulfilled (Coakes & Steed, 2003). The ratio of cases to independent variables, outliers, multicollinearity and normality, linearity, independence of residual and homoscedascity were completely tested. According to Bartlett, Kortlik and Higgins (2001), the ratio of cases to independent variables used was five cases to each variable. Furthermore, the ratio of ten cases to one independent variable was also fulfilled (Miller & Kunce, 1973). Besides that, case wise diagnostics were used to test for outliers and no case of outliers was found.

In this study, normality had been tested by obtaining skewness and kurtosis value of the variables (Pallant, 2001). The variable was considered normally distributed, if the skewness value was below 2.0 and kurtosis value below than 7.0 (Cohen & Cohen, 1983). Based on the performance of normality assessment tables, the researcher concluded that all constructs in the research variables have a skewness value lower than 2.0 and kurtosis value smaller than 7.0. Overall, all the variable were distributed under

the normal data. Residual plots against the predicted dependent values were utilized to test the linearity and homoscedascity. Durbin-Watson is between 1.5 and 2.5, the assumption of independence of error term is not violated (Norusis, 1999). See Appendices B; shows the multiple regression assumption testing.

4.10.2 The Research Question and Hypotheses

This section discusses all the finding of this study. All the research questions are answered accordingly using the descriptive analysis and all the hypotheses are tested using hierarchical regression. The technique was applied where; step 1 – it used to test independent variables; integrator involvement in product innovativeness, product modularity and internal coordination and grower involvement with business performance. Step 2 was used to test the model independent variables; integrator involvement in product innovativeness, product modularity and internal coordination and grower involvement with moderator; accountancy financial management skill, decision making skill towards business performance. Step 3 was used to test interaction effect with business performance.

The strength of independent variables to predict dependent variables during regression was determined through the use of standard beta, part and partial correlation coefficients (Green & Salkind, 2008). For this case, the higher standardised beta values explain that independent variables are stronger at predicting dependent variables.

4.10.3 Multiple Regression Results

4.10.3.1 Integrator and Grower Involvement towards Business Performance

Multiple regression analysis was conducted to determine the relationship between Integrator and Grower Involvement towards Business Performance (Financial). The result shown in Table 4.24 indicates that the regression equation with predictors was significant, R= .603, R^2 = 0.363, Adjusted R^2=0.354. In other words, the multiple correlations between the predictor and the dependent variable were .603; the predictor accounted for 36.3% of the variance in the Business Performance (financial).

The generalizability of this model towards business performance (financial), adjusted R square was .354. The value of R^2 dropped to only .009 (about 1%) in the adjusted R^2 which indicates that the cross validity of this model was fine. Table 4.24 shows the individual contributor of each predictor with a regression equation. Among predictors, Integrator Involvement; Product Modularity (PM), Beta .310, t=5.341, p=0.000 and Internal Coordination (IC), Beta .293, t=4.559, p=0.000. The Product Modularity had the highest standardized co-efficient, which indicates it was the important variable in prediction Business Performance (Financial). The two independent variables impacted on dependent variable in the direction hypothesized. Thus, better business performance can be obtained when a company has strong product modularity and internal coordination on their business activity.

Table: 4. 24

Multiple Regression Result Between Relationships of Integrator and Grower Involvement Towards Business Performance (Financial)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
1	.603 a	0.363	0.354	0.53267	0.363	39.919	0.000

a. Dependent Variable: Business Performance (Financial)

	Un-standardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1 (Constant)	3.795	.032		120.277	.000		
PI	.041	.051	.052	.815	.416	.549	1.820
PM	.295	.055	.310	5.341	.000	.674	1.484
IC	.283	.062	.293	4.559	.000	.552	1.810
GI	.063	.053	.077	1.185	.237	.535	1.869

Dependent variable: Business performance (Financial)

The summary of hypotheses testing for the direct relationship between integrator and grower involvement towards business performance (financial) is shown in the Table 4.25 below.

Table: 4. 25

Summary of Hypotheses Testing on The Direct Effect Towards Business Performance (Financial)

Hypotheses	Statements of hypotheses	Remarks
H1a	Product Modularity (PM) has positive significant relationship with Business Performance (BP Financial)	Supported H1a hypotheses
H1b	Internal Coordination (IC) has positive significant relationship with Business Performance (BP Financial)	Supported H1bhypotheses
H1c	Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Financial)	Rejected H1c hypotheses
H2a	Grower Involvement (GI) has positive significant relationship with Business Performance (BP Financial)	Rejected H2a hypotheses

Table: 4.25 (continued)

Variables	Business Performance	Remarks
PI	B=.041, t= .815	H1c Rejected
PM	B=.295, t=5.341	H1a supported
IC	B=.283, t=4.559	H1b supported
GI	B=.063, t=1.185	H2a Rejected

Multiple regression analysis was conducted to determine the relationship between Integrator and Grower Involvement towards Business Performance (Non-Financial). The result shown in Table 4.26 indicates that the regression equation with predictors was significant, R= .727, R^2 = 0.528, Adjusted R^2=0.522. In other words, the multiple correlations between the predictor and the dependent variable were .727; the predictor accounted for 72.7% of the variance in the Business Performance (non-financial).

The generalizability of this model, adjusted R square was .528. The value of R^2 dropped to only .006 (almost 1%) in the adjusted R^2 which indicates that the cross validity of this model was fine. Table 4.27 shows the individual contributor of each predictor with a regression equation. Among predictors, Integrator Involvement; Product Innovativeness (PI), Beta .405, t=7.316, p=0.000, Internal Coordination (IC), Beta .133, t=2.404, p=0.017 and Product Modularity (PM), Beta .113, t=2.265, p=0.024. Predictor Grower Involvement (GI), Beta .222, t=3.950, p=0.000 The Product Innovativeness had the highest standardized co-efficient, followed by Grower Involvement, which indicates these important variables in prediction of Business Performance (Non-Financial). The two independent variables impacted on dependent variable in the direction hypothesized. Thus, better business performance can be obtained when a company has strong product innovativeness and grower involvement on their business activity.

Table: 4. 26

Multiple Regression Result between relationships of Integrator and Grower Involvement Towards Business Performance (Non-Financial)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
1	.727[a]	.528	.522	.41264	.528	78.456	.000

a. Dependent Variable: Business Performance (Non-Financial)

	Un-standardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	3.887	.024		159.008	.000		
PI	.288	.039	.405	7.316	.000	.549	1.820
PM	.097	.043	.113	2.265	.024	.674	1.484
IC	.116	.048	.133	2.404	.017	.552	1.810
GI	.162	.041	.222	3.950	.000	.535	1.869

Dependent variable: Business performance (Non-Financial)

The summary of hypotheses testing for the direct relationship between integrator and grower involvement towards business performance (non-financial) is shown in the Table 4.27 below.

Table: 4. 27

Summary of Hypotheses Testing on The Direct Effect Towards Business Performance (Non-Financial)

Hypotheses	Statements of hypotheses	Remarks
H1d	Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial)	Supported H1d hypotheses
H1e	Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial)	Supported H1e hypotheses
H1f	Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial)	Supported H1efhypotheses
H2b	Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial)	Supported H2b hypotheses

Table: 4.27 (continued)

Variables	Business Performance	Remarks
PI	B=.405, t=7.316	H1d supported
PM	B=.113, t=2.265	H1e supported
IC	B=.133, t=2.404	H1f supported
GI	B=.222, t=3.950	H2b supported

4.10.3.2 The Moderating effect of Integrator and Grower Involvement towards Business Performance

This section discusses the moderator variable and business performance. Therefore, in order to investigate the moderating effects and interaction effects, the three- step hierarchical regression was utilised. Next step tested moderator effect towards business performance and followed by test interaction effects. The hypotheses predicted that managerial skills (accountancy and financial management skill, decision making skill) moderate the relationship between integrator involvement (product innovativeness, product modularity, internal coordination) and grower involvement towards business performance.

The outcome from these analyses will provide the answer whether the managerial skill (MS) does really play its role as a moderating variable in this relationship. These analyses will explain the answer to hypotheses H3, H4, H5 and H6. Hierarchical regression analysis was performed to test the moderating effect of managerial skill on the relationship between integrator and grower involvement towards business performance.

Baron and Kenny (1986), Frazier, Barron and Tix (2004) suggested hierarchical regression or famously known as moderator regression that has become a technique providing answers on the moderating effect that it plays in any relationship. The argument stated by Russ and McNelly (1995) says that less stringent significance level of

p<.25 should be used to resolve the lack of power in detecting the effect of the moderator. Three levels of significance (1%, 5%, and 10%) were applied in this study to detect the moderating effect of the managerial skills on the relationship between integrator and grower involvement towards business performance. In order to test moderating effect, there were three hierarchical steps used. This was conducted to determine what proportion of the variance in particular variables was explained by other variables. Cramer (2003) suggested it can be done especially when these variables enter into the regression analysis of certain assortments.

The first step, direct effect tries to be determined using independent variable. Second step, this is done by putting the moderating variable to measure whether the moderator (managerial skill) has a significant direct impact on the dependent variable (business performance). Third step, the interaction term (the first independent variable and moderating variable) were entered to see any additional variance explained.

The presence of moderating effect can be detected if step three shows a significant R^2 square increase with a significant F-value change. The moment step three shows a significant increase it can be concluded that there is existence of moderating effect. To confirm the moderating effect further, it can be looked into the t-value and p-value under the co-efficient table. To discuss further, a post hoc test should be done to identify whether such variable is a pure moderator or quasi moderator variable. Table 4.28 and Table 4.29 illustrate the results of the hierarchical regression analysis.

Table: 4.28

Hierarchical Results Using Managerial Skill as a Moderator in The Relationship between Integrator Involvement and Grower Involvement Towards Business Performance (Financial)

Independent variable	**Std Beta Step 1**	**Std Beta Step 2**	**Std Beta Step 3**
Model variables			
Product Innovativeness	0.052	-0.018	-0.043
Product Modularity	0.310	0.281	0.295
Internal Coordination	0.293	0.201	0.209
Grower Involvement	0.077	0.024	0.018
Moderating variable			
Accountancy and Financial Management Skill		0.297	0.359
Decision Making Skill		0.521	0.468
Interaction terms			
PI*Accountancy and Financial Management Skill			-0.245
PM* Accountancy and Financial Management Skill			0.047
IC* Accountancy and Financial Management Skill			0.297
GI* Accountancy and Financial Management Skill			0.081
PI*Decision Making Skill			-0.077
PM*Decision Making Skill			-0.042
IC*Decision Making Skill			0.172
GI*Decision Making Skill			0.219

Table: 4.29

R2	0.363	0.410	0.473
Adjusted R^2	0.354	0.400	0.456
R^2 Change	0.363	0.047	0.063
Sig. F Change	0.000	0.000	0.000
Durbin Watson			1.705

*p<0.1, **p<0.05, ***p<0.01

Table: 4.30

Hierarchical Results Using Managerial Skill as a Moderator in The Relationship between Integrator Involvement and Grower Involvement Towards Business Performance (Non-Financial)

Independent variable	**Std Beta Step 1**	**Std Beta Step 2**	**Std Beta Step 3**
Model variables			
Product Innovativeness	0.405	0.338	0.383
Product Modularity	0.113	0.085	0.091
Internal Coordination	0.133	0.046	0.026
Grower Involvement	0.222	0.172	0.199
Moderating variable			
Accountancy and Financial Management Skill		0.281	0.302
Decision Making Skill		-0.069	-0.021
Interaction terms			
PI*Accountancy and financial Management Skill			0.260
PM* Accountancy and financial Management Skill			-0.027
IC* Accountancy and financial Management Skill			-0.076
GI* Accountancy and financial Management Skill			-0.015
PI*Decision Making Skill			-0.144
PM*Decision Making Skill			0.065
IC*Decision Making Skill			0.115
GI*Decision Making Skill			-0.079
R^2	0.528	0.571	0.601
Adjusted R^2	0.522	0.563	0.588
R^2 Change	0.528	0.042	0.031
Sig. F Change	0.000	0.000	0.000
Durbin Watson			1.727

*p<0.1, **p<0.05, ***p<0.01

Moderating effect of Accountancy and Financial Management Skill on Relationship between Product Innovativeness towards Business Performance (Financial)

Table 4.30 shows the results of the hierarchical regression analysis of the moderating effect of accountancy and financial management skill on relationship between product innovativeness and business performance (financial). Product Innovativeness factor was entered first in step 1, explaining 60.3% of the variance. After the entry of accounting and financial management skill at step 2, the total variance explained by the model as a whole was 68.8% in step 3.

Table: 4. 31

Multiple Regression Result using Accountancy and Financial Management Skill as a Moderator in Relationship between Product Innovativeness and Business Performance (Financial)

Model 3	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
PI x Accountancy	-0.213	0.064	-0.245	-3.322	0.001**	0.351	2.847

*p<0.1, **p<0.05, ***p<0.01

Moderating effect Accountancy and Financial Management Skill on Relationship between Internal Coordination towards Business Performance (Financial)

Table 4.31 shows the results of the hierarchical regression analysis of the moderating effect of accountancy and financial management skill on relationship between internal coordination and business performance (financial). Internal Coordination factor was entered first in step 1, explaining 60.3% of the variance. After the entry decision making skill at step 2, the total variance explained by the model as a whole was 68.8% in step 3.

Table: 4. 32
Multiple Regression Result Using Accountancy and Financial Management Skill as a Moderator in Relationship between Internal Coordination Towards Business Performance (Financial)

Model 3	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
IC x	B	Std. Error	Beta			Tolerance	VIF
Accountancy	0.307	0.093	0.297	3.308	0.001**	0.237	4.216

*p<0.1, **p<0.05, ***p<0.01

Moderating effect Decision Making Skill on Relationship between Internal Coordination towards Business Performance (Financial)

Table 4.32 shows the results of the hierarchical regression analysis of the moderating effect of decision making skill on relationship between internal coordination towards business performance (financial). Internal Coordination factor was entered first in step 1, explaining 60.3% of the variance. After the entry decision making skill at step 2, the total variance explained by the model as a whole was 78.5% in step 3.

Table: 4. 33
Multiple Regression Result using Decision Making Skill as a Moderator in Relationship between Internal Coordination Towards Business Performance (Financial)

Model 3	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
IC x	B	Std. Error	Beta			Tolerance	VIF
Decision	0.200	0.063	0.172	2.918	0.004**	0.402	2.485

*p<0.1, **p<0.05, ***p<0.01

Moderating effect Decision Making Skill on Relationship between Grower Involvement towards Business Performance (Financial)

Table 4.33 shows the results of the hierarchical regression analysis of the moderating effect of decision making skill on relationship between grower involvements towards

business performance (financial). Grower involvements factor was entered first in step 1, explaining 60.3% of the variance. After the entry decision making skill at step 2, the total variance explained by the model as a whole was 78.5% in step 3.

Table: 4. 34
Multiple Regression Result Using Decision Making Skill as a Moderator in Relationship between Grower Involvement Towards Business Performance (Financial)

Model 3	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
GI x Decision	B	Std. Error	Beta			Tolerance	VIF
	0.213	0.063	0.219	3.379	0.001**	0.331	3.019

*p<0.1, **p<0.05, ***p<0.01

Moderating effect Accountancy and Financial Management Skill on Relationship between Product Innovativeness towards Business Performance (Non-Financial)

Table 4.34 shows the results of the hierarchical regression analysis of the moderating effect of accountancy and financial management skill on relationship between product innovativeness towards business performance (non-financial). Product innovativeness factor was entered first in step 1, explaining 72.7% of the variance. After the entry decision making skill at step 2, the total variance explained by the model as a whole was 77.5% in step 3.

Table: 4. 35
Multiple Regression Result Using Accountancy and Financial Management Skill as a Moderator in Relationship between Product Innovativeness Towards Business Performance (Non-Financial)

Model 3	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
PI x Accountancy	B	Std. Error	Beta			Tolerance	VIF
	0.204	0.050	0.260	4.052	0.000***	0.351	2.847

*p<0.1, **p<0.05, ***p<0.01

Moderating effect Decision Making Skill on Relationship between Product Innovativeness towards Business Performance (Non-Financial)

Table 4.35 shows the results of the hierarchical regression analysis of the moderating effect of accountancy and financial management skill on relationship between product innovativeness towards business performance (non-financial). Product innovativeness factor was entered first in step 1, explaining 72.7% of the variance. After the entry decision making skill at step 2, the total variance explained by the model as a whole was 77.5% in step 3.

Table: 4. 36

Multiple Regression Result Using Decision Making Skill as a Moderator in Relationship between Product Innovativeness Towards Business Performance (Non-Financial)

Model 3	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
PI x Decision	-0.125	0.071	-0.144	-1.765	0.079*	0.249	4.014

*p<0.1, **p<0.05, ***p<0.01

Moderating effect Decision Making Skill on Relationship between Internal Coordination towards Business Performance (Non-Financial)

Table 4.36 shows the results of the hierarchical regression analysis of the moderating effect of decision making skill on relationship between internal coordination towards business performance (non-financial). Internal coordination factor was entered first in step 1, explaining 72.7% of the variance. After the entry decision making skill at step 2, the total variance explained by the model as a whole was 77.5% in step 3.

Table: 4. 37

Multiple Regression Result using Decision Making Skill as a Moderator in Relationship between Internal Coordination Towards Business Performance (Non-Financial)

Model 3	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
PI x Decision	B	Std. Error	Beta			Tolerance	VIF
	0.121	0.067	0.115	1.795	0.074*	0.402	2.485

*p<0.1, **p<0.05, ***p<0.01

The following Table 4.37 below summarises results in relation to the hypotheses set out at the beginning of the study.

Table: 4. 38

Summaries Results in Relation to The Hypotheses

Hypotheses	**Statement**	**Supported/Rejected**
H1	**Integrator Involvement towards Business Performance**	
H1a	Product Modularity (PM) has positive significant relationship with Business Performance (BP Financial)	Hypothesis is supported
H1b	Internal Coordination (IC) has positive significant relationship with Business Performance (BP Financial)	Hypothesis is supported
H1c	Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Financial)	Hypothesis is rejected
H1d	Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial)	Hypothesis is supported
H1e	Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial)	Hypothesis is supported
H1f	Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial)	Hypothesis is supported
H2	**Grower Involvement towards Business Performance**	
H2a	Grower Involvement (GI) has positive significant relationship with Business Performance (BP Financial)	Hypothesis is supported
H2b	Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial)	Hypothesis is supported

Table: 4.39 (continued)

H3	**Integrator Involvement towards Business Performance moderated by Accountancy and Financial Mgt. Skill**	
H3a	Product Modularity (PM) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.	Hypothesis is rejected
H3b	Internal Coordination (IC) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.	Hypothesis is supported
H3c	Product Innovativeness (PI) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.	Hypothesis is supported
H3d	Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.	Hypothesis is rejected
H3e	Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.	Hypothesis is rejected
H3f	Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.	Hypothesis is supported
H4	**Integrator Involvement towards Business Performance moderated by Decision Making Skill**	
H4a	Product Modularity (PM) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.	Hypothesis is rejected
H4b	Internal Coordination (IC) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.	Hypothesis is supported
H4c	Product Innovativeness (PI) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.	Hypothesis is rejected

Table: 4.40 (continued)

H4d	Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.	Hypothesis is rejected
H4e	Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.	Hypothesis is supported
H4f	Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.	Hypothesis is supported
H5	**Grower Involvement towards Business Performance moderated by accountancy and financial mgt. Skill**	
H5a	Grower Involvement (GI) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.	Hypothesis is rejected
H5b	Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.	Hypothesis is rejected
H6	**Grower Involvement towards Business Performance moderated by decision making skill.**	
H6a	Grower Involvement (GI) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.	Hypothesis is supported
H6b	Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.	Hypothesis is rejected

4.11 Summary

In general, the results of this study have captured the fact that the extent of integrator and grower involvement in contract broiler production is important, are reliable, and agree with the previous study. However, the moderating effects of managerial skill on business performance show significant interaction between integrator involvement in product innovativeness, internal coordination, grower involvement with accountancy and

financial management skill and decision making skill. In summarising, the chapter mentions the findings of this study. The data is clean with a low level of bias. The geographic distribution among them is fairly distributed with main concentration of the poultry industry areas in Malaysia. Then, factor analysis was conducted to validate the dimensions. Factors analysed produced different dimensions compared to the previous study. After descriptive test was done, correlation test and regression tests were done to answer the hypothesized questions. Several of the findings under Pearson correlations were as expected and in concurrence with previous findings. The multiple regression results showed that the integrator involvement in product innovativeness and internal coordination; it also showed grower involvement contributed to the business performance. Few of the moderators moderate the relationship between integrator involvement and grower involvement towards business performance relationship. The findings of this study were interesting as it pointed to several stimulating relationships between the variables. Further discussion and conclusion in the next chapter will elaborate more on the result and their implication to the theory.

CHAPTER FIVE

DISCUSSIONS OF FINDINGS AND CONCLUSION

This chapter not only recapitulates the results but also discusses the findings thoroughly as well. It begins with the introduction section that provides an overview of the study. Summary of the study was elaborated further that gives insight on how the process of the entire study has been conducted. Next, concluding findings of the research objectives have been delivered. Moreover, it will cover the contributions for the academia and its possible application in the industry. The implication of this study, theoretical and practical is also presented. Finally, this study's limitation, future research suggestions and overall conclusions are also highlighted and presented.

5.1 Introduction

Integrator and grower involvement have become a common issue in broiler contract farming. A feature of low productivity in agricultural economies is the dominance of subsistence production especially among small capacity growers. Even though commercialization can yield substantial gains, the transition from subsistence farming to market driven production is to load danger (Von- Braun & Kennedy, 1994). First, market volatility is an enduring feature of commodity and livestock markets. This makes cultivation of cash crops and livestock risky. Second, as incomes grow, consumer taste shifts in good will of processed foods. Small farmers are too remote from consumers to track their preferences. Third, small farmers typically lack capital and technical expertise

to undertake livestock production, which are usually more input intensive than subsistence yields. These problems are serious enough that they could effectively block off participation in markets by all except the large farmers. In principle, contract farming could be an institutional arrangement that enables growers to access markets. While contractual arrangements can vary by country, contracting is a form of joint production where the grower supplies equipment, land, labour and management while the integrator supplies technical assistance, some inputs such as day old chicks (D.O.C), drugs and undertakes to buy the grower's output at a pre-determined price. From the point of view of the integrator, this arrangement ensures raw material supplies of the desired quality (subject, of course, to production uncertainty). From the point of view of the grower, such an arrangement provides an assured market and hence reliable income (to the extent permitted by production risks). Without a contract, risks would be too much and few small growers would want to produce these crops. For this reason, Glover and Teck Ghee (1992) described contract farming as an institutional arrangement that combined the advantages of plantations (quality control, coordination of production and marketing) and of smallholder production (superior incentives, equity considerations).

Despite these theoretical benefits, contract farming has been controversial and has been criticized for being exploitative (Little-Peter *et al.,* 1994). Between the giant corporation and the small farmer, bargaining power surely lies with the former. Also, in practice, growers have encountered problems with respect to manipulation of quality standards, poor technical assistance, and sometimes plain cheating and deliberate default (Glover, 1987). As a result, Glover (1987) concluded that research must "systematically examine successes and failures and from them draw generalizations about the conditions under

which contract farming can operate profitably and to the benefit of small farmers" (p 447). Taking this essential seriously, this study is an empirical analysis of the gains from contract farming, to both integrator and grower involvement, in the case of integrator and grower involvement for broiler production in Peninsula Malaysia. The literature on contract farming is largely unrealiable possibly because of lack of data. Here is a survey of contract broiler producers to analyze these issues.

5.2 Summary of the study

The summary of the study will be addressed according to the research questions, research method and followed by the process and procedure of obtaining the data. One of the purposes of this study was to explore the relationship between Integrator and grower involvement and business performance. The extent of integrator and grower involvement; in poultry industry, the relationship between product innovativeness, product modularity, and internal coordination variables towards business performance in broiler production in Malaysia were investigated as well. There are four main research questions that guided the study, these question are:

Do any relationships exist between product innovativeness, product modularity and internal coordination variables with regard to business performance?

Which variable involving the integrator has the greatest impact on the performance of a business?

Which variables between the involvement of the Integrator and the Grower affect business performance?

Does the level of managerial skills have any moderating effect on business performance?

The independent variables in this study are integrator involvements and grower involvement. Integrator involvement has three dimensions, namely product innovativeness, product modularity, and internal coordination; component analysis confirmed this. Grower involvement has one dimension. A moderating variable, types of managerial skills was introduced between integrator, grower involvement, and business performance. The variable was used to analyze managerial skills of poultry production operators in Soumeh Sara Township in Guilan province, Iran (Allahyari, Saburi & Keshavarz, 2011; Vachon, 2003). Previous study revealed among management skills; marketing skill had been placed the least ranking means. In addition, poultry production operators had the best ability in technical skills.

Rotated component analyses were used to test the factorial validity of the measures used in this study. Internal consistency of the measures was tested by computed reliability coefficient. Hierarchical regression analysis was used in order to test study's hypotheses. The significance levels of 0.1, 0.05 and 0.01were used in order to determine whether the hypotheses were supported or rejected.

5.3 Discussion

The following section discusses thoroughly all the research questions of this study. Thus, it describes in detail the extent of integrator and grower involvement in broiler production, the relationship between integrator and grower involvement towards business performance, and the moderating effect of the managerial skill. In addition, the chapter recapitulates the study's implications in terms of theoretical and practical contributions to the organization, limitations to the study and suggestions about future research.

The findings are summarized as follows. It includes the statement of hypotheses and the result obtained as shown, Table 5.1:

Table: 5. 1
Research Objectives, Research Questions, and Summary Results

Research Objectives	**Research Questions**	**Test of Hypotheses**			
To examine the relationship between product innovativeness, product modularity, and internal coordination variables towards business performance.	Are there relationship between product innovativeness, product modularity, and internal coordination variables towards business performance?	H1a H1b H1c H1d H1e H1f H2a H2b	 supported 	r = 0.509 r = 0.512 r = 0.420 r = 0.486 r = 0.548 r = 0.666 r = 0.433 r = 0.591	p< 0.01 p < 0.01 p < 0.01 p < 0.01 p < 0.01 p < 0.01 p < 0.01 p < 0.01
To examine which variable in integrator involvement has the largest effect on the business performance	What is the variable in the integrator involvement that has the largest effect on the business performance?	H1a H1b H1c H1d H1e H1f	Supported Supported Rejected Supported Supported Supported	B = .310 B = .293 B = .052 B = .113 B = .133 B = .405	t = 5.341 t = 4.559 t = .815 t = 2.265 t = 2.404 t = 7.316
To determine either integrator or grower involvement has the largest effect on business performance	Which variables that have the largest effect on business performance between integrator and grower involvement?	H1f	Supported	B = .405	t = 7.316
To investigate the moderating effect of managerial skills variable on relationship between integrator involvement, grower involvement and business performance	Is there any moderating effect between managerial skill variable towards business performance?	H3a H3b H3c H3d H3e H3f H4a H4b H4c H4d H4e H4f H5a H5b H6a H6b	Rejected Supported Supported Rejected Rejected Supported Rejected Supported Rejected Rejected Supported Supported Rejected Rejected Supported Rejected	B = .047 B = .297 B = -.245 B = -.027 B = -.076 B = .260 B = -.042 B = .172 B = -.077 B = .065 B = 0.115 B = -.144 B = .081 B = -.015 B = .219 B = -.079	t = .792 t = 3.308 t = -3.322 t = -.530 t = -.968 t = 4.052 t = -.828 t = 2.918 t = -1.025 t = 1.169 t = 1.795 t = -1.765 t = .926 t = -.198 t = 3.379 t = -1.117

5.3.1 The Extent of Integrator and Grower involvement

This study focus with the aim of evaluating the extent of integrator involvement which include; product innovativeness, product modularity, internal coordination and grower involvement for broiler contract production. The extent of integrator and grower involvement practices in Malaysian broiler contract production can be observed from Table 4.22 which shows that; independent variables, product innovativeness showed the highest mean value of 3.96 with standard deviation of 0.83. This indicates that all the participating contract broiler producers were concerned about product innovativeness such as producing new birds to your growers from time to time, creating new method to marketing system for broiler, and creating new technology for how to grow broiler from time to time, are very important. Meanwhile, the component of dependent variable; business performance (non-financial) has the mean value 3.88 and standard deviation 0.59, thus respondents seem to be putting a lot emphasis on technical components of farming. Business performance (non-financial) includes; delivery speed and reliability (timeliness of delivery), short production cycle time, small defects and low rework rate, product reliability of the company, retention of growers and growers relations. Next followed by business performance (financial) which shows mean value 3.79 with standard deviation 0.66. All respondents agreed that low cost of quality (inspection) as percentage of total sales, low cost of production per unit, sales revenue, profitability and return on investment (ROI) are very important. Furthermore, the component of independent variables followed by grower involvement (mean=3.85) with (standard deviation=0.81), product modularity (mean=3.72) with (standard deviation=0.69), and internal coordination (mean=3.69) with (standard deviation=0.68). The standard

deviations of all independent variables ranging from 0.69 to 0.83 were relatively small, explaining that most respondents were close to the mean of all independent variables. Meanwhile the range of standard deviation for dependent variables from 0.59 to 0.66 shows most respondents were close to the mean of dependent variables.

The first main hypothesis (H1) stated that there is a relationship between integrator involvement and business performance. The results of the test of the differences analysis provided support for this hypothesis. In addition, all independent factors, integrator involvements provided a positive correlation with business performance.

The first sub-hypothesis (H1a) in this research stated that Product Modularity (PM) has positive significant relationship with Business Performance (BP Financial). Given that the correlation coefficient value for the tested relationship between both variables was .509, which is considered as a positive moderate, it can be said that a positive moderate relationship exists and there is adequate strength in this hypothesis.

The second sub-hypothesis (H1b) stated that internal coordination (IC) has positive significant relationship with Business Performance (BP Financial). The correlation coefficient value for the tested relationship between both variables was .512, which is considered as a moderate showing the relationship exists in this hypothesis.

The third sub-hypothesis (H1c) stated that product innovativeness (PI) has positive significant relationship with Business Performance (BP Financial). The correlation coefficient value for the tested relationship between both variables was 0.420, which is considered exist relationship which also means that there is moderate in this hypothesis.

The sub-hypothesis (H1d) stated that product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial). The correlation coefficient

value for the tested relationship between both variables was 0.486, which is considered exist relationship which also means that there is moderate in this hypothesis.

The sub-hypothesis (H1e) stated that internal coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial). The correlation coefficient value for the tested relationship between both variables was .548, which is considered as a moderate. There is exist relationship in this hypothesis.

The sub-hypothesis (H1f) stated that product innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial). The correlation coefficient value for the tested relationship between both variables was 0.666, which is considered exist relationship which also means that there is moderate in this hypothesis.

The second main hypothesis (H2) stated that there is a relationship grower involvement and business performance. The results of the test of the differences analysis provided support for this hypothesis. In addition, all independent factors, grower involvements provided a positive correlation with business performance.

The sub-hypothesis (H2a) stated that Grower Involvement (GI) has positive significant relationship with Business Performance (BP Financial). The correlation coefficient value for the tested relationship between both variables was 0.433, which is considered exist relationship which also means that there is moderate in this hypothesis.

The sub-hypothesis (H2b) stated that Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial). The correlation coefficient value for the tested relationship between both variables was 0.591, which is considered exist relationship which also means that there is moderate in this hypothesis.

Multiple regressions analysis was carried out to answer the other research questions as well as to test the research hypotheses. It was necessary to make a number of assumptions to carry out the multiple regression analysis. The assumptions were in the context of normality, linearity, homoscedasticity, independence of errors terms, and multicollinearity. Multiple regression analysis allows the researcher to get relative contributions from all variables and shows the variable that proves to be the best indicator of outcomes. While evaluating each of the independent variables it became known that all variables contributed significantly to the business performance. The very positive contribution was made by internal coordination and product innovativeness on business performance. Other variables were found to impact strongly as well as negatively towards business performance in contract broiler production.

5.3.2 The Moderating Effect

The present study is designed to determine the moderating effect of integrator and grower involvement on the business performance (financial) and (non-financial) relationship. Therefore, the four research questions are whether managerial skills moderate the relationship between integrator involvement and grower involvement towards business performance.

Barron & Kenny (1986), moderator variable effects the direction/or strength of the relationship between an independent variable and a dependent variable. The most remarkable finding is that seven interaction effects were encountered. As discussed in chapter 2, it is possible to suggest that the relationship between integrator and grower involvement may be moderated by managerial skill. The hierarchical regression analysis

was used to test the moderating effects of managerial skill on business performance strength as depicted in Table 4.28 and Table 4.29. Next, the hypotheses results will be discussed thoroughly related to moderating effect of managerial skill on relationship between integrator and grower involvement towards business performance.

The main third hypothesis stated that managerial skills (accountancy and financial management skill) moderates between integrator involvements towards business performance. Internal coordination and product innovativeness were found to make a considerable contribution towards variance of accountancy and financial management skill to business performance having been taken into account. Moreover, the research results indicated that the R square value and Sig. F Change values show that accountancy and financial management skill has made significant, unique contributions to the variance of business performance after integrator involvement had been taken into account.

It became evident that most possibility factors in terms of internal coordination and product innovativeness had considerable impact upon business performance. Therefore, the outcome was relative to the fact that accountancy and financial management skill is mostly found to be a moderator in the relationships amongst integrator involvement and business performance. Thus, it can be said that managerial skill has moderating impact on relationships amongst integrator involvement and business performance.

The main fourth hypotheses stated that managerial skills (decision making skill) moderates between integrator involvements towards business performance. Internal coordination and product innovativeness were found to make a considerable contribution towards variance of decision making skill to business performance having been taken into account. Moreover, the research results indicated that the R square value and Sig. F

Change values show that decision making skill has made significant, unique contributions to the variance of business performance after integrator involvement had been taken into account.

The main fifth hypotheses stated that managerial skills (accountancy and financial management skill) moderates between grower involvements towards business performance.

5.3.2.1 Moderating effect of managerial skill towards business performance (financial)

The hypotheses predicted that managerial skill (decision making, accountancy and financial management skill) moderate the relationship between integrator and grower involvement towards business performance. Table 4.28 and Table 4.29 illustrate the results of hierarchical regression analysis using integrator and grower involvement dimension. The standardized coefficient (Beta) for each variable is shown in the respective step.

The independent variable integrator involvement (product modularity, product innovativeness, and internal coordination) and grower involvement entered at step one. Second step, showed moderator variables; decision making skill (Beta=0.521) was significant 0.000 (R^2=0.617, F change value=10.642); moderator accountancy and financial management skill (Beta=0.297) was significant 0.000 (R^2=0.557, F change value=8.211). In the third step, the interaction between decision making skill, accountancy and financial management skill with independent variables; product modularity, product innovativeness, internal coordination and grower involvement

showed that there were a number of significant relationships with business performance (financial), R^2=0.473, R^2 change=0.063, F change=8.211, $p<0.05$. The significant interactions were between product innovativeness and accountancy financial management skill; internal coordination and accountancy financial management skill; internal coordination and decision making skill and grower involvement and decision making skill. Thus, the hypothesesH3b, H3c, H4band H6a were supported.

Hypothesis H3a stated that product modularity (PM) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between product modularity towards business performance (financial) relationship.

Hypothesis H3b stated Internal Coordination (IC) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show that internal coordination has made significant, unique contributions to the variance of business performance (financial) after accountancy and financial management skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that internal coordination has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial

skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H3c stated Product Innovativeness (PI) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show that product innovativeness has made significant, unique contributions to the variance of business performance (financial) after accountancy and financial management skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that product innovativeness has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H4a stated that Product Modularity (PM) has positive significant relationship with Business Performance (financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by decision making skill between product modularity towards business performance (financial) relationship.

Hypothesis H4b stated Internal Coordination (IC) has positive significant relationship with Business Performance (financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show that internal coordination has made significant, unique contributions to the variance of business performance

(financial) after decision making skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that internal coordination has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H4c stated that Product Innovativeness (PI) has positive significant relationship with Business Performance (financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by decision making skill between product innovativeness towards business performance (financial) relationship.

Hypothesis H5a stated that Grower Involvement (GI) has positive significant relationship with Business Performance (financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between grower involvements towards business performance (financial) relationship.

Hypothesis H6a stated Grower Involvement (GI) has positive significant relationship with Business Performance (financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show that grower involvement has made significant, unique contributions to the variance of business performance (financial) after decision making skill had been taken into account. Additionally,

managerial skill made a contribution towards the variance of business performance. It became known that grower involvement has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between grower involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships grower involvement and business performance.

5.3.2.2 Moderating effect of managerial skill towards business performance (non-financial)

The hypotheses predicted that managerial skill (decision making, accountancy and financial management skill) moderate the relationship between integrator and grower involvement towards business performance. Table 4.28 and Table 4.29 illustrate the results of hierarchical regression analysis using integrator and grower involvement dimension. The standardized coefficient (Beta) for each variable is shown in the respective step.

The independent variable integrator involvement (product modularity, product innovativeness, and internal coordination) and grower involvement are entered at step one. Second step, showed moderator variables; decision making skill (Beta=0.532) was not significant (R^2=0.532, F change value=2.0); moderator accountancy and financial management skill (Beta=0.281) was significant 0.000 (R^2=0.571, F change value=27.525). In the third step, the interaction between decision making skill, accountancy and financial management skill with independent variables; product modularity, product innovativeness, internal coordination and grower involvement

showed that there were a number of significant relationships with business performance (non-financial), R^2=0.601, R^2 change=0.31, F change=5.267, p<0.01. The significant interactions were between product innovativeness and accountancy financial management skill; internal coordination and decision making skill and product innovativeness and decision making skill. Thus, the hypotheses H3e, H3f and H4f were supported.

Hypothesis H3d stated that product modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between product modularity towards business performance (non-financial) relationship.

Hypothesis H3e stated that Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between internal coordination towards business performance (non-financial) relationship.

Hypothesis H3f stated Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show that product innovativeness has made significant, unique contributions to the variance of business performance (non-financial) after accountancy and financial management skill had been taken into account. Additionally, managerial skill made a

contribution towards the variance of business performance. It became known that product innovativeness has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H4d stated that Product Modularity (PM) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by decision making skill between product modularity towards business performance (non-financial) relationship.

Hypothesis H4e stated Internal Coordination (IC) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show that internal coordination has made significant, unique contributions to the variance of business performance (non-financial) after decision making skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that internal coordination has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H4f stated Product Innovativeness (PI) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show that product innovativeness has made significant, unique contributions to the variance of business performance (non-financial) after decision making skill had been taken into account. Additionally, managerial skill made a contribution towards the variance of business performance. It became known that product innovativeness has an impact on business performance. Therefore, managerial skill was found to be an important moderator in the link between integrator involvements towards business performance. It can therefore be said that there is strength in the hypothesis. Managerial skill has moderating impact on the relationships amongst integrator involvement and business performance.

Hypothesis H5b stated that Grower Involvement (GI) has positive significant relationship with Business Performance (non-financial) moderated by accountancy and financial management skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between grower involvements towards business performance (non-financial) relationship.

Hypothesis H6b stated that Grower Involvement (GI) has positive significant relationship with Business Performance (non-financial) moderated by decision making skill. The results revealed that the R square value and Sig. F Change values show there is no significant relationship. Thus, there is no moderating effect by accountancy and financial management skill between grower involvements towards business performance (non-financial) relationship.

A post hoc graph and test were done for the significant interactions.

The first graph in Figure 5.1 below shows that there is a positive relationship between integrator involvements in product innovativeness towards business performance (financial) for contract broiler firms. This relationship indicates that when firms get high degree product innovativeness, the increase in accountancy and financial management skill would lead to better business performance (financial). However, the rate of change is bigger at low product innovativeness and low accountancy and financial management skill compared the rate of change at high product innovativeness and high accountancy and financial management skill.

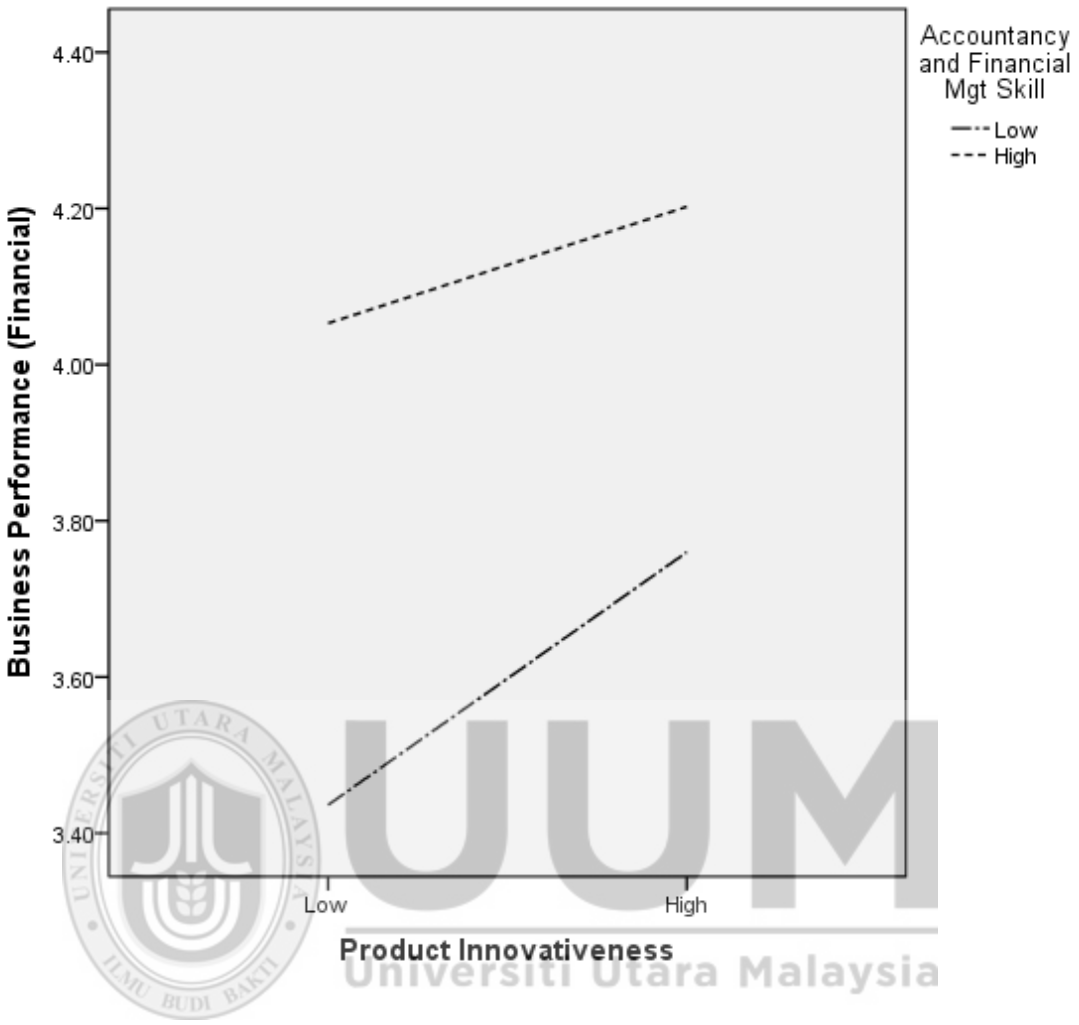

Figure: 5.1
The Relationship between Integrator Involvements in Product Innovativeness towards Business Performance (Financial) with Accountancy and Financial Management Skill as a Moderator

The second graph in Figure 5.2 below shows that there is a positive relationship between integrator involvements in internal coordination towards business performance (financial) for contract broiler firms. This relationship indicates that when firms get high degree internal coordination, the increase in decision making skill would lead to better business performance (financial). However, the rate of change is bigger at high internal

coordination and high decision making skill compared the rate of change at low internal coordination and low decision making skill.

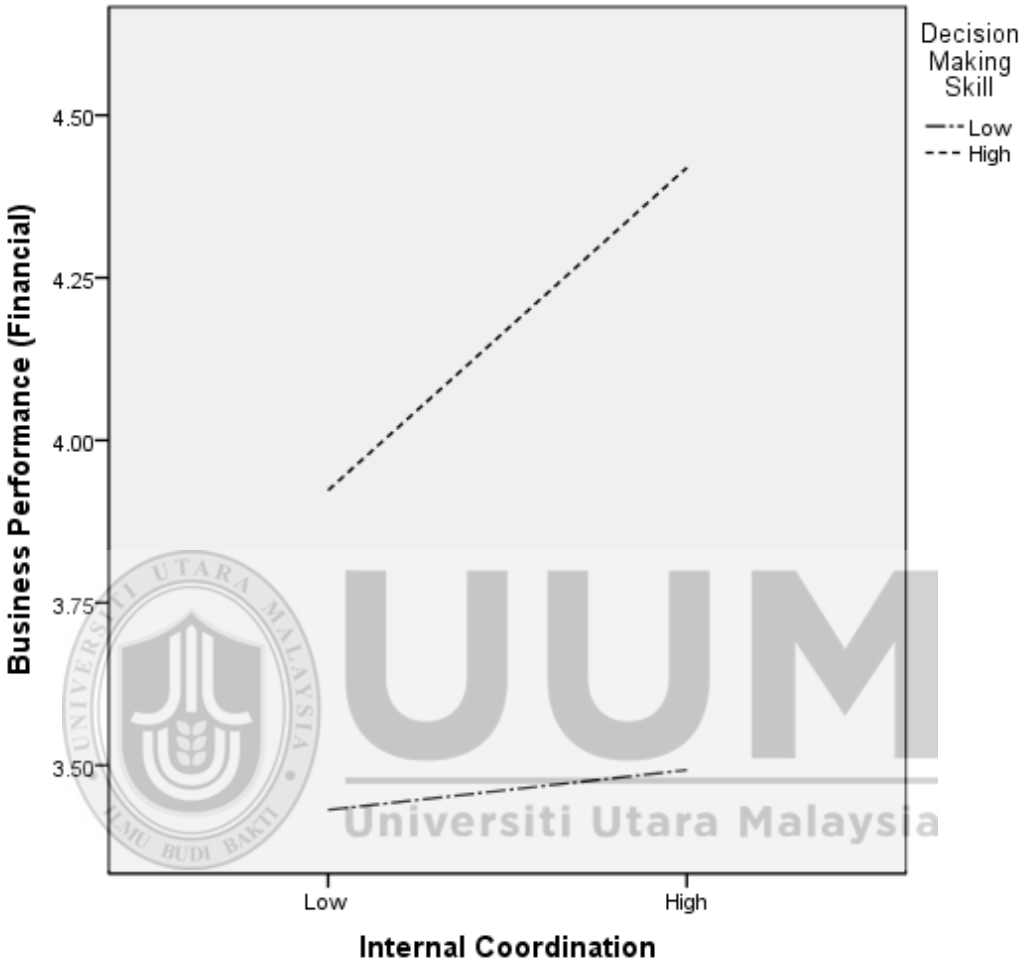

Figure: 5.2
The Relationship between Integrator Involvements in Internal Coordination towards Business Performance (Financial) with Decision Making Skill as a Moderator

The third graph in Figure 5.3 below shows that there is a positive relationship between integrator involvements in internal coordination towards business performance (financial) for contract broiler firms. This relationship indicates that when firms get high degree product internal coordination, the increase in accountancy and financial management skill

would lead to better business performance (financial). However, the rate of change is bigger at high internal coordination and high accountancy and financial management skill compared the rate of change at low internal coordination and low decision making skill.

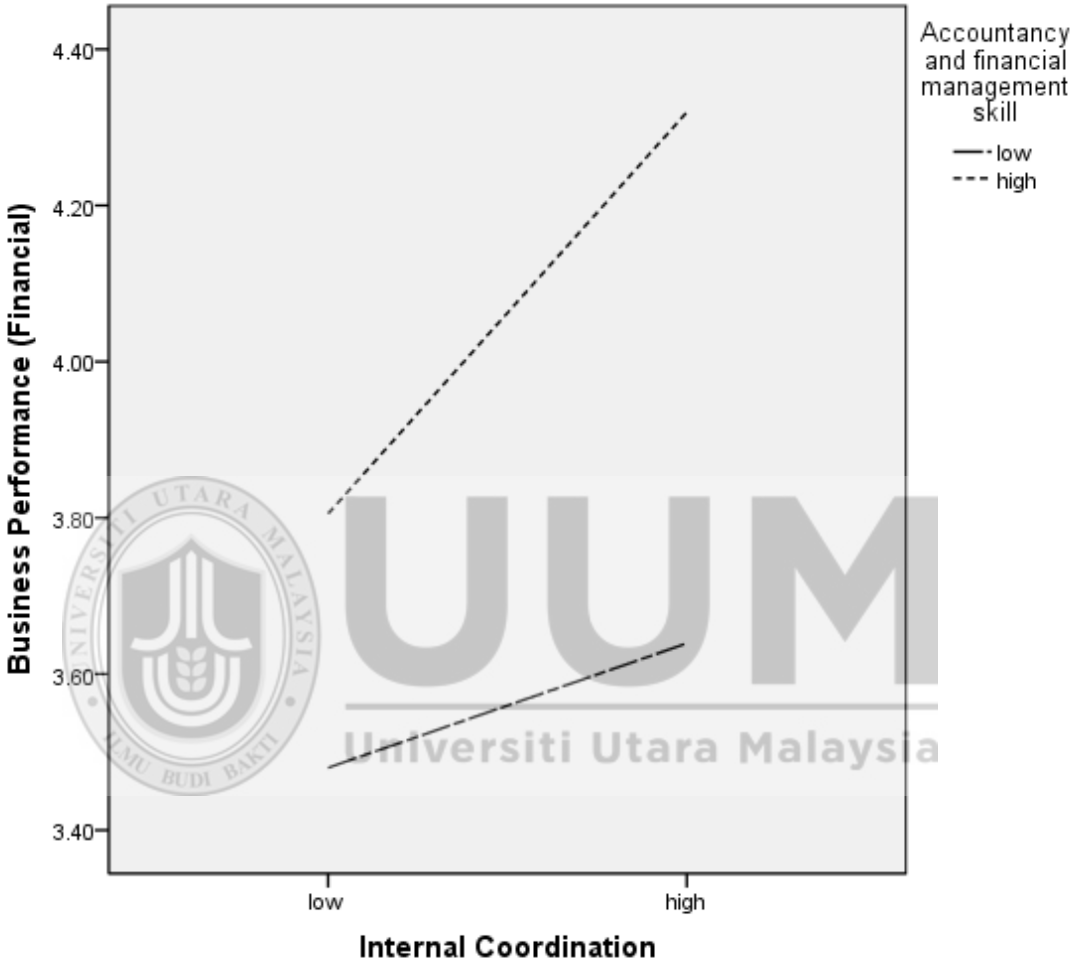

Figure: 5.3
The Relationship between Integrator Involvements in Internal Coordination towards Business Performance (Financial) with Accountancy and Financial Management Skill as a Moderator

The third graph in Figure 5.4 below shows that there is a positive relationship between grower involvements towards business performance (financial) for contract broiler firms. This relationship indicates that when firms get high degree of grower involvement, the

increase in decision making skill would lead to better business performance (financial). However, the rate of change is bigger at high grower involvement and high decision making skill compared the rate of change at low grower involvement and low decision making skill.

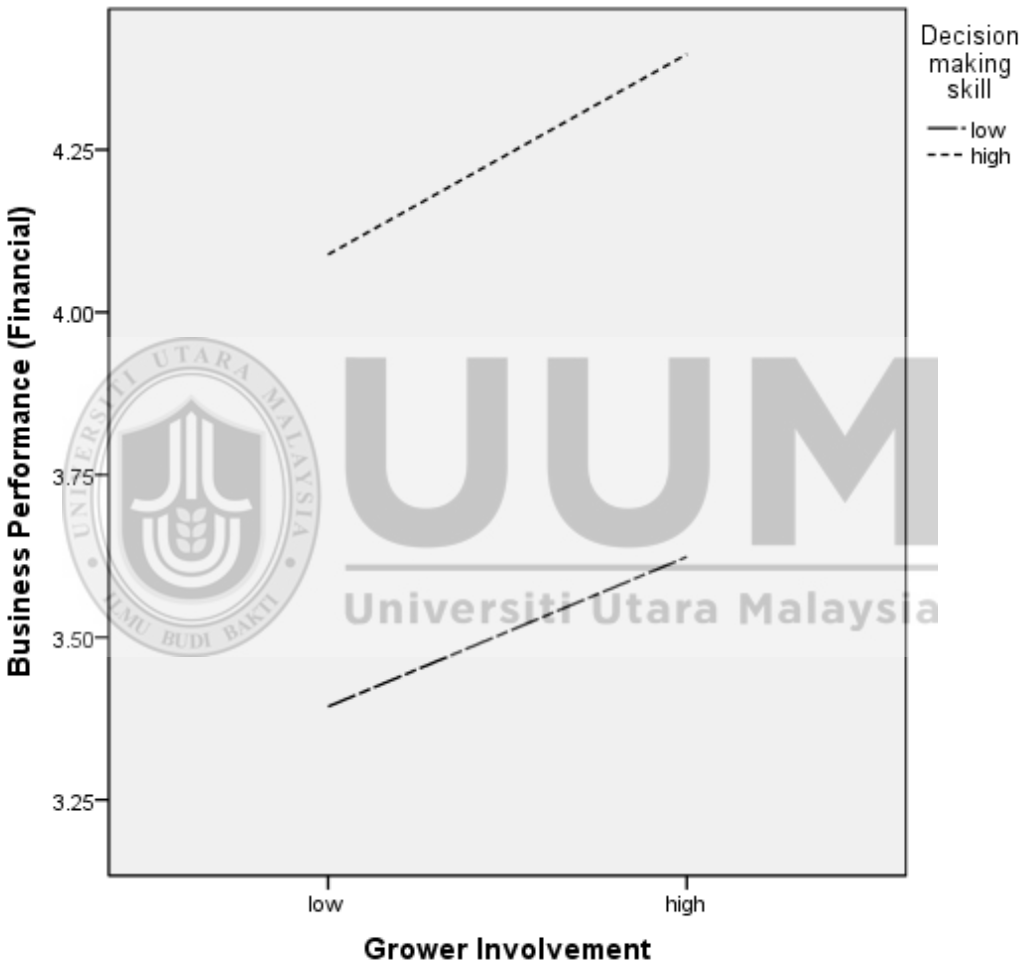

Figure: 5.4
The Relationship between Grower Involvements towards Business Performance (Financial) with Accountancy and Financial Management Skill as a Moderator

The graph in Figure 5.5 below shows that there is a positive relationship between integrator involvements in product innovativeness towards business performance (non-financial) for contract broiler firms. This relationship indicates that when firms get high degree of product innovativeness, the increase in accountancy and financial management would lead to better business performance (non-financial). However, the rate of change is bigger at low product innovativeness and low accountancy and financial management skill compared the rate of change at high product innovativeness and high accountancy and financial management skill.

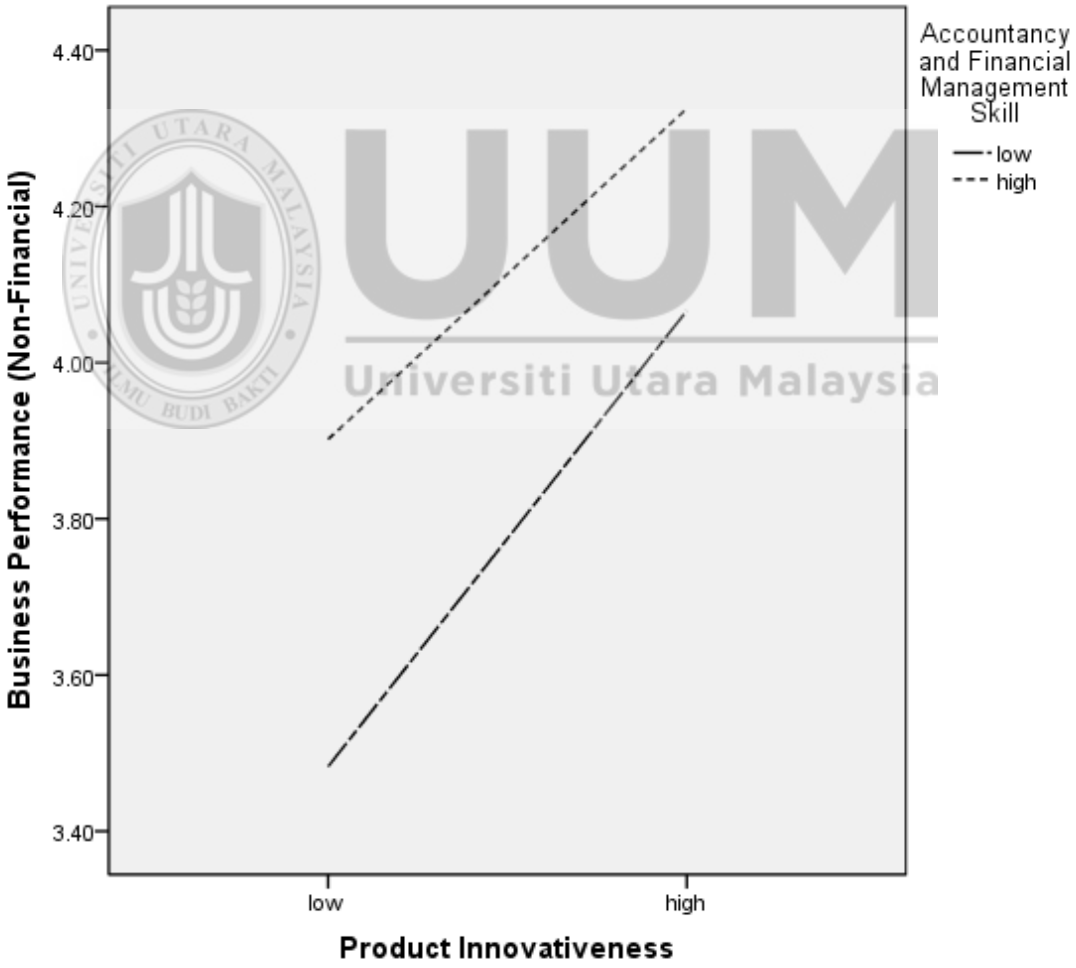

Figure: 5.5
The Relationship between Integrator Involvements in Product Innovativeness towards Business Performance (Non-Financial) with Accountancy and Financial Management Skill as a Moderator

The graph in Figure 5.6 below shows that there is a positive relationship between integrator involvements in product innovativeness towards business performance (non-financial) for contract broiler firms. This relationship indicates that when firms get high degree of product innovativeness, the increase in decision making skill would lead to better business performance (non-financial). However, the rate of change is bigger at low product innovativeness and low decision making skill compared the rate of change at high product innovativeness and high decision making skill.

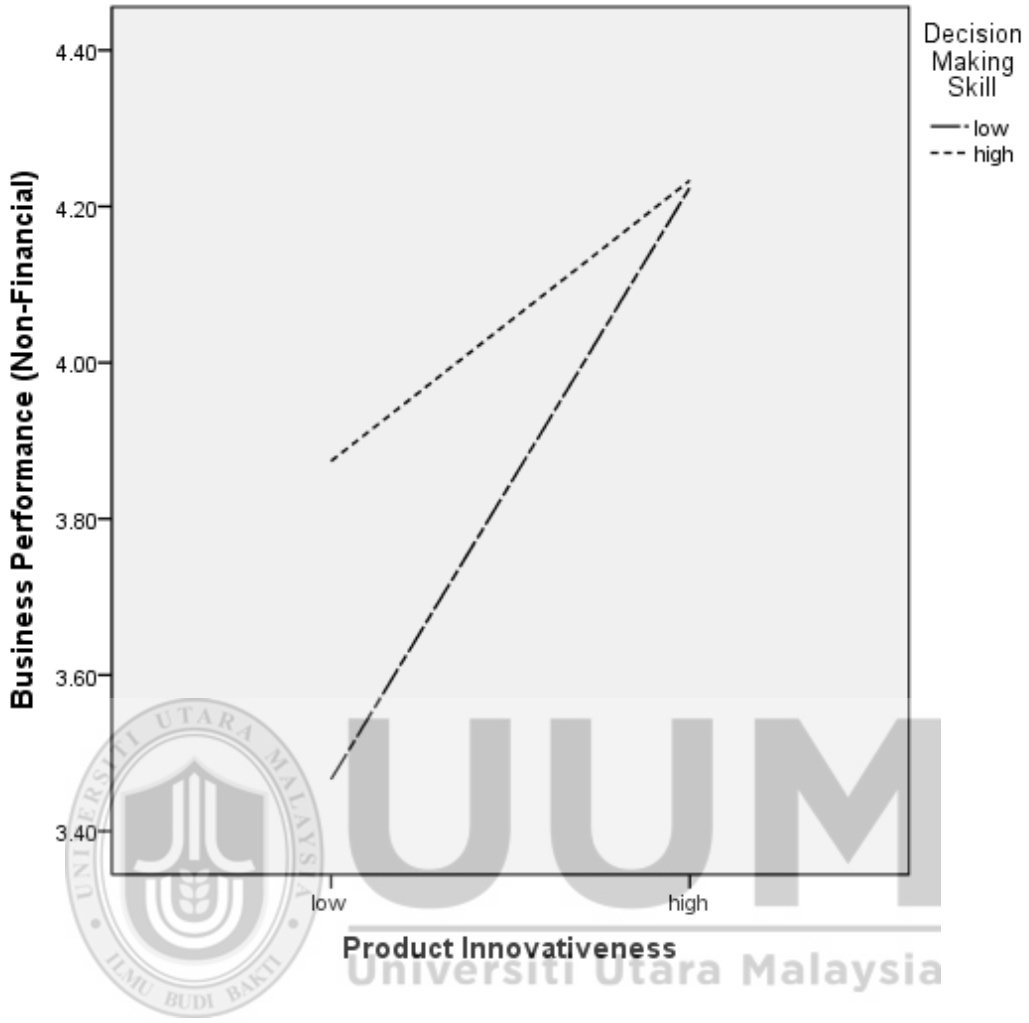

Figure: 5.6
The Relationship between Integrator Involvements in Product Innovativeness towards Business Performance (Non-Financial) with Decision Making Skill as a Moderator

The graph in Figure 5.7 below shows that there is a positive relationship between integrator involvements in internal coordination towards business performance (non-financial) for contract broiler firms. This relationship indicates that when firms get high degree of internal coordination, the increase in decision making skill would lead to better business performance (non-financial). However, the rate of change is bigger at low

internal coordination and low decision making skill compared the rate of change at high internal coordination and high decision making skill.

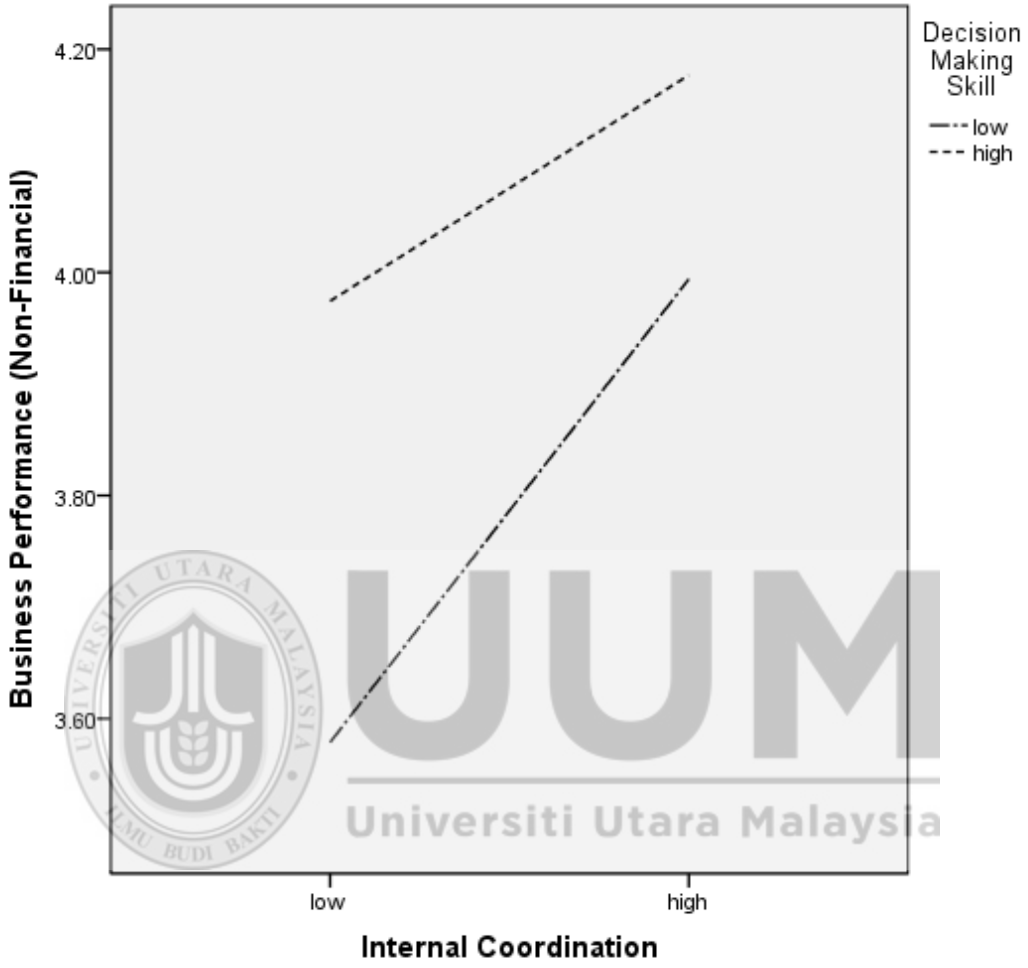

Figure: 5.7
The Relationship between Integrator Involvements in Internal Coordination towards Business Performance (Non-Financial) with Decision Making Skill as a Moderator

5.4 Summary of the findings

The findings are summarized as follows. It includes the statement of hypotheses and the result obtained.

H1 Integrator Involvement towards Business Performance

H1a Product Modularity (PM) has positive significant relationship with Business Performance (BP Financial)

H1b Internal Coordination (IC) has positive significant relationship with Business Performance (BP Financial)

H1c Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Financial)

H1d Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial)

H1e Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial)

H1f Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial)

The above hypotheses were tested using Pearson correlation. Findings showed that hypotheses H1a, H1b, H1d, H1e, and H1f of the integrator involvement variables are significantly associated with business performance. Thus, the hypotheses are supported.

H2 Grower Involvement towards Business Performance

H2a Grower Involvement (GI) has positive significant relationship with Business Performance (BP Financial)

H2b Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial)

The Pearson correlation test indicated that grower involvement and business performance was significantly correlated which indicates that hypothesis H2b is supported.

H3 Integrator Involvement towards Business Performance moderated by Accountancy and Financial and Management Skill

H3a Product Modularity (PM) has positive significant relationship with Business Performance (BP-Financial) moderated by accounting and financial management skill.

H3b Internal Coordination (IC) has positive significant relationship with Business Performance (BP-Financial) moderated by accounting and financial management skill.

H3c Product Innovativeness (PI) has positive significant relationship with Business Performance (BP-Financial) moderated by accounting and financial management skill.

H3d Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accounting and financial management skill.

H3e Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accounting and financial management skill.

H3f Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accounting and financial management skill.

Multiple regression tests were conducted to test the above hypotheses. Finding indicates a combination of internal coordination and accounting and financial management skill significantly explained business performance (financial). During the interaction stage, internal coordination was significant. Thus, the results support hypothesis H3b. Moreover, combination of product innovativeness and accountancy and financial management skill significantly explained business performance (financial). During interaction stage, product innovativeness was significant. Thus, the result supports hypothesis H3c. The combination of product innovativeness and accountancy and financial management skill significantly explained business performance (financial). During interaction stage, product innovativeness was significant. Thus, the result supports hypothesis H3f.

H4 Integrator Involvement towards Business Performance moderated by Decision Making Skill

H4a Product Modularity (PM) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.

H4b Internal Coordination (IC) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.

H4c Product Innovativeness (PI) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.

H4d Product Modularity (PM) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.

H4e Internal Coordination (IC) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.

H4f Product Innovativeness (PI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.

Multiple regression tests were conducted to test the above hypotheses. Finding indicates a combination of internal coordination and decision making skill significantly explained business performance (financial). During the interaction stage, internal coordination was significant. Thus, the results support H4b. Moreover, combination of internal coordination and decision making skill significantly explained business performance (non-financial). During interaction stage, internal coordination was significant. Thus, the result supports hypothesis H4e. Combination of product innovativeness and decision making skill significantly explained business performance (non-financial). During interaction stage, product innovativeness was significant. Thus, the result supports hypothesis H4f.

H5 Grower Involvement towards Business Performance moderated by accountancy and financial mgt. Skill

H5a Grower Involvement (GI) has positive significant relationship with Business Performance (BP-Financial) moderated by accountancy and financial management skill.

H5b Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by accountancy and financial management skill.

Multiple regression tests were conducted to test the above hypotheses. Finding indicates none of combination has significant relationship.

H6 Grower Involvement towards Business Performance moderated by decision making skill

H6a Grower Involvement (GI) has positive significant relationship with Business Performance (BP-Financial) moderated by decision making skill.

H6b Grower Involvement (GI) has positive significant relationship with Business Performance (BP Non-Financial) moderated by decision making skill.

Multiple regression tests were conducted to test the above hypotheses. Finding indicates combination of grower involvement and decision making skill significantly explained business performance (financial). During the interaction stage, grower involvement was significant. Thus, the results support H4a.

As a summary, the chapter mentions the findings of this study. The geographic distribution among them is fairly distributed with main concentration on poultry industry areas in Malaysia. Then, factor analysis was conducted to validate the dimensions. After descriptive test was done, correlation test and regression tests were done to answer the

hypothesized questions. Several of the findings under Pearson correlations were as expected and in concurrent with previous findings.

The multiple regression results showed that integrator involvement and grower involvement contributed to the business performance. Few of the moderators moderate the relationship between integrator, grower involvement and business relationship. Most of the moderators were pure moderators. The findings of this study were interesting as it pointed to several stimulating relationships between the variables.

The results of this study show that company's ability to fully perform is influenced by the appropriate skills. Previous research by other authors Allahyari, Saburi and Keshavarz (2011) had indicated that the mean rate of respondents ability in the area of broiler farm management is 3.81 (SD= 0.61); indicating the moderate to high level. The ability to record carried out production in poultry production (M=4.24) is the first priority of managers ability in this area. Also, the ability to record used inputs in poultry production enterprise (M=4.22) and the ability to record and calculate initial capital rate of poultry production enterprise (M=4.16) allocated the second and third priority of managers ability. Thus, the results of this study support the findings of previous researchers. Table 5.7 below shows Mean and Standard Deviation for accountancy and financial management skill.

Table: 5.2

Mean and Standard Deviation for Accountancy and Financial Management Skill

Rank	Accountancy and financial management skill	M	SD
1	Ability to record the activities in broiler production period.	4.10	0.786
2	Ability to record consumed inputs in broiler production	4.09	0.863
3	Ability to record and calculate the amount of initial capital in broiler production.	4.09	0.819
4	Ability to record and calculation of profit and loss in broiler production	4.12	0.778
5	Ability to use a good and effective accounting system	4.01	0.820

Allahyari, Saburi and Keshavarz (2011) described, decision making skill designated that managers' ability in this area is in moderate to high extent (M=3.67, SD=0.66). In order to measure this skill, six statements had been used which among these, operators consider their ability to take correct decision on technologies showed more strengthen than the other properties (M=3.86, SD=0.91). The ability to effectively use advice from production advisors (economical, veterinary, nutrition etc.) (M=3.74, SD=0.94) was the second property which poultry production companies' manager found their ability in it. The ability to rapid-analyze situations which they did not face till now (M=3.50, SD=0.84), was the least reported properties from respondents relatively. Thus, the results in Table 5.8, of this study also, supported the findings by previous researchers. Moreover the grower's management skills, which impact the broiler growth rate and death losses (Hamilton-Neil, 2001). From a management standpoint, an operator can increase profits by increasing his/hers technical skill such as watching for feed waste and making the necessary adjustments to reduce it, observing for overflow of water, keeping the litter dry and clean, staying alert to fan breakdowns, and paying attention to signs of stress and disease.

Table: 5. 3
Mean and Standard Deviation for Decision Making Skill

Rank	Decision making skill	M	SD
1	Ability to make decision about technologies to be used or be accepted	3.60	0.908
2	Ability to effectively use advice from livestock advisors (economical, veterinary, nutrition, etc.)	3.79	0.892
3	Ability to use best management operations broiler production units	3.84	0.843
4	Ability to take right decisions about time or acceptance of new technologies	3.77	0.810
5	Ability to quickly identify and correct farming problems and the principles to solve the problems.	3.86	0.822

The current study makes some important theoretical and practical contributions. The contributions of the current study will be discussed based on the outcomes of the study accordingly. In general, the contribution of this study can be observed from both, a theoretical and a practical perspective.

Presently weak management of production factors and economic inefficiency of production is a major problem in the poultry farming. Incorrect practices are related to low technical skills of the producers. Yaaghubi (2009) suggested paying attention to farm management and recognition of its restricting factors and providing suitable executive ways, will be a good way to change in production of agricultural products and ideal use of production factors. Farms producers need managerial skills to take correct decisions. According to Al-Rimawi (2006), skills enable them to manage their profession, effectively facing with the changes in agribusiness environment and remain successful in the high competitive trade environment.

The results of this research indicate that among the studied managerial skills had moderating effect relationship between integrator and grower involvement towards business performance. The important independent variable that contributed to explain business performance of contract broiler production in this research is product innovativeness. Previously other researcher, (Avlonitis & Salavou, 2007), used product innovativeness from the firm's and the customer's perspective; more specifically, this study has been done by a five-point Likert-type scale adapted from (Atuahene-Gima, 1995). According to this dimension, the innovativeness level of a new product is reflected in a continuum from less to more innovative for the customers, who either use or consume it. Integrator involvement in product innovativeness in this research include;

production of new birds by the growers from time to time are very important, creating new method to marketing system for broiler is a crucial and creating new technology how to grow broiler from time to time are very important. Bonaccorsi and Lipparini (1994) suggested product innovativeness; time to market can be reduced by concurrent engineering, earlier identification of technical problems, reduced suppliers' process engineering time, and acquisition of suppliers' production capacity. Also, product innovativeness is generally considered as an important indicator of performance (Molina-Castillo & Munuera-Aleman, 2009a). Moreover, technology adoption has been the dominant approach to consumers and users in innovation management (Rogers, 1995). Previous research, done by Heiskanen *et al.,* (2007), found that companies introducing new product innovations may need to take consumers' resistance more seriously. They might need to reconsider the acceptability of new product innovations, and integrate these considerations at earlier stages of the innovation cycle.

Previous researchers proved that internal coordination in poultry business has become an important method of organization of agricultural production in numerous commodity livestock feeding, and dairy production and marketing, to name a few (USDA, 2004). Contracts are an integral part of the production of broilers, turkeys, and eggs. The poultry industry is often cited as a model of the organization that may come to characterize much of U.S. farming in the future. Clark and Fujimoto (1991) suggested that in order to support inter-firm collaborations in product development, firms need to integrate and coordinate the activities of different internal business functions.

However, only a few studies have actually attempted to investigate their interactions. Takeishi (2001) pointed out how component design quality by a supplier is affected by

internal coordination within engineering departments and coordination between engineering and purchasing. Koufteros *et al.* (2005) observed a positive relationship between concurrent engineering and supplier product integration, but a negative relationship between supplier product integration and product innovation. However, this study modeled internal integration as an antecedent for external integration and did not examine their interaction directly. Recently, Mishra and Shah (2009) found a positive relationship between internal integration and supplier involvement with project performance, but no relationship with market performance. Subsequently, they modeled the integration efforts as a latent variable and observed a better model fit leading them to point to the possibility of synergy between external and internal integration. However, they did not explicitly test for the interaction effect.

For poultry, contracts are agreements between integrator and grower that specify conditions of producing and marketing chickens and other poultry products. By specializing in the various phases of production, contracting can reduce participant's exposure to production or price risk. Based on that situation, this research's findings are very significant and have proven that in order to get better performance strong business coordination is needed. With strong internal coordination growers also benefit from technical advice, managerial expertise, market knowledge, and access to technological advances (such as proprietary genetics) not otherwise available (Doye *et al.*, 1992).

The existent of internal coordination in broiler contract scheme has been established in achieving a higher level of product consistency. Broilers have been produced under contract since mid-century, and 85 percent of chickens are grown under contract. Most of

the remaining chickens are grown on farms owned and operated by the integrator (USDA, 2004).

Internal coordination is crucial because contracts usually provide for incentives and penalties for management of the flock. Growers are penalized when their cost per pound of live meat produced is above the average cost per pound for the pool of growers. For below-average settlement costs (above average performance), the grower receives a bonus (SEARCA, 1999). As far as operational implication of this study are concerned, the finding for internal coordination, moderated by accountancy and financial management skill, can prove to be fairly useful in managerial decision making and improving performance in contract broiler production.

In this research internal coordination includes; integrator and grower are always sharing the data; are always practicing teamwork; implementing activities together with close coordination; implementing close coordination in product design & development; have interactive system between production and sales division; have close coordination in product launching; and have Integrated inventory management.

In summary, a review of the literature leads to conclude that the existing research has primarily focused either on intra-firm collaboration related to integration of different functions within an organization (e.g. management of design-manufacturing-marketing interface) or on inter-firm collaboration related to manufacturer-supplier interface and/or manufacturer-customer interface. Only a few studies have examined the internal and external interrogation issues together (Eisenhardt & Tabrizi, 1995). Recent attempts (Koufteros *et al.*, 2005; Mishra & Shah, 2009) to study the interaction between internal and external integration effort used indirect and complex methodology leading to

contradictory findings and often a source of confusion. Issues related to the interaction between intra-firm and inter-firm collaboration remains an open question and an underexplored area of research.

5.4.1 Theoretical contribution

Although there have been previous works for the relationship between supplier and customer involvement on business performance, the current research has developed a novel and comprehensive measurement model specifically for integrator and grower involvement towards business performance in contract broiler production.

The empirical finding by validating the variables simultaneously has concluded in a comprehensive framework from the conceptual models into a managerial framework of business performance surrounding integrator, grower and managerial skills to meet business requirements. When the broiler producers get the suitable coordination between integrator and grower and embedded managerial skills, it gets additional value. At the same time broiler producer has the ability to improve farming operation. The positive result of the relationship of integrator and grower involvement towards business performance, which was moderated by: 1) accountancy and financial management skill, and 2) decision making skill; signaled the different role played in that relationship. There must be some mechanism that could produce better performance results in that relationship.

Second, from the survey, the findings have strengthened empirical evidences for the research framework and supported the hypotheses conceptual models. As the empirical evidence was acquired from broiler production industry in Malaysia, this model can be

replicated and tested on other separate poultry sector, beef, dairy and any livestock industry. This has created the foundation and groundwork for future researchers to use it as a base and gain deeper insights into integrator and grower involvement.

Third, the measurement instruments has been rigorously tested and validated. The instruments developed for this research capture three important components for integrator involvement, namely; product innovativeness, product modularity and internal coordination. Whereas one important aspect; grower involvement which is a compulsory component for broiler contract production been included in this research frameworks.

Fourth, the findings from the post hoc analysis between the extents of integrator involvement in product innovativeness, product modularity, internal coordination, and grower involvement; discovered mixed results. Whereas when it comes to the influence of managerial skill, the results showed differently towards business performance. This indicates that each component played an important role and played differently in the contract broiler business performance.

In the implementation stage, it can be concluded that these two categories namely; integrator involvement and grower involvement have strong emphasis on broiler farming operation towards business performance. At the same time, these components; product innovativeness, product modularity, internal coordination and grower involvement have different roles towards delivering business performance.

The key contribution for this research is the combined dimension of three dimensions of integrator involvement namely; 1) product innovativeness, 2) product modularity, and 3) internal coordination and grower involvement, that offer a new perspective to the field of broiler contract production. In term of moderating effect; the component of managerial

skill can also be considered a new aspect in the research framework. Future researchers in poultry industry can leverage these measurement tools for long term planning especially in contract farming and complementing the problem and issues in poultry industry.

5.4.2 Practical contribution

Firstly, the research profile provided evidences that contract broiler producers have begun to change their operation to closed housed system as a means for modern and competitive advantage and value creation. Base on the survey 55.4% of the responding companies have proven implementing new technology which is closed housed system in the contract broiler production.

Most of the companies have shown interest in improving their involvement in order to create value to meet market demand and achieve tangible business gains. The findings provided insight into businesses, especially in the role of integrator involvement and grower involvement.

Secondly, the findings demonstrated the industry players need to increase working skill for their managerial group that includes; financial management skill and decision making skill in order to increase business performance.

By proposing, developing, and testing this research framework, and demonstrating the positive impact to the business performance, managerial group for contract broiler production has a tool to evaluate their involvement. This empirically tested framework can be used as managerial guidance for contract broiler producers in real business environment which needs to focus on new technology in daily operation.

5.5 Limitation of the study

This research is limited to the perspective of integrator and grower involvement. The integrator involvement includes a few dimension namely; product innovativeness, product modularity, and internal coordination. Whereas grower involvement has uni-dimension, other elements such as quality and reliability on performance are not included. Therefore the space for further research is wide open to other researchers.

In this research, methods targeting officers who have vast experiences in the broiler production with knowledge in farming operation for the company's performance caused difficulties to the researcher. Respondents profile shows only 3.5% having experiences more than 20 years followed by 10.9% having service 16 to 20 years, 21.1% having 11 to 15 years, and the rest having below than 11 years. This could be another limitation as the target group of respondents is always busy with the daily routine and work schedule in their department. It is understood that broiler producers work really hard and busy in making sure that their products meet the requirements of the market such as; bird quality, survivability rate, and short batch cycle. Furthermore, this research detected a lack of participation from farm managers, which is 5.5%; perhaps, pointing to that they are well versed with the farming operation.

This research lies in the measure. All variables are measured on simple 1-5 scales. Future research can use well designed constructs with more items. Additionally, comparative studies can be conducted to probe into the difference in integrator and grower involvement and impact on business performance in different countries or industries.

Although standards of production and consumer attitudes vary from country to country, quality assurance and traceability in food production have become a global issue with growing complexity and importance, as a result of changing consumer priorities and increased consumer power (Holroyd, 2001). Meeting these changing demands will be a challenge for all producers. More courses and seminars should be provided to contract farmers. As stressed by (Abu Hassan, Hassan, Shaffril & D'Silva, 2009), attending courses and seminars on something can change mind-sets. In addition, such courses and seminars would raise public awareness on the importance of sustainable agriculture.

The results obtained have proven that the majority of contract growers possess lack of managerial skill towards business performance. Thus, there are chances for concerned parties to use this finding trend to launch action programs presenting new techniques in broiler contract farming; acquiring increased managerial skill is crucial to enhance their farming ability in contract farming practices.

Knowledge can hold the key for constructing a better component towards business performance. Knowledge sharing between contract farmers, their colleagues and integrators about all aspects of farming practices is important. Here, effective training could determine the success of the information dissemination and sharing process.

More local research should be conducted to discover new ideas relevant to contract growers' involvement towards contract farming. Research will unveil new knowledge on managerial skill, and the respective parties can share their research findings and information obtained with the contract scheme.

This study only investigates the simultaneous impact of integrator and grower involvement on business performance. This research is designed from a two-party

perspective; it can be done to a three-party perspective. The three-party perspectives will have an impact on the research on integrator, grower involvement and business performance in the future. The three-party perspective and multi dimension of performance will greatly enrich the research on business performance in the future.

5.6 Conclusion

This chapter wraps up the study. It explains the implications as related to findings of this study. The implications cover the theoretical and managerial aspects whereby they suggest few issues. Among the theoretical implications are related to the constructs and their ability to contribute to the understanding of supply chain management theory. Managers are caution on the managerial skill ability they organized so that their planning for future decision is more objective. Finally, the chapter posted several suggestions for future research. This study discovers the relationship between few dimensions of integrator involvement in product innovativeness, product modularity, internal coordination and grower involvement with business performance. The effect of accountancy and financial management skill, decision making skill are also supposed to be necessary for an effective business performance. Managerial group in the company's commitment in working skills have moderating effect.

The result thus suggests that in order for businesses to capitalize and benefit from the working skills, companies need to train their staff in field; technical and administrative. This would avoid striving on unnecessary activities that will not to be adequate in improving businesses' competitiveness. Effort to engage in learning activities for further

improvement in knowledge help companies to absorb more knowledge and will benefit in the long run. To make business performance works, learning and experience that ones have will become the foundation for further innovation. Only thorough continuous learning can improve company's ability to be more innovative.

Though this study demonstrated that at the earlier stage of business performance there was no relationship between integrator and grower involvement; not having this relationship does not mean that the factors are not important. What it might indicate is that there might be trust on technology provider to bring in the expertise to make the transfer work.

The other crucial point raised in this study was the appropriateness of technology which has a high impact on the business performance. Empirically, this study demonstrated its importance and urged firms to focus on it when engaging in managerial skill. On top of that, companies' investment in quality practices also helps in ensuring the knowledge well absorbed by the staff. Thus, besides of only increasing grower satisfaction with quality services and consultation, this study proves that acquiring better managerial skills also help in strengthening the companies' ability to benefit and increase business performance.

Generally, managerial skill which involves decision making skill, accountancy and financial management skill showed moderating effect on relationship between integrator and grower involvement towards business performance relationships. These moderating effects have also shown that organizational resources influenced the strength of integrator and grower involvement and broiler business performance relationship. Finally, the current study has also presented sufficient theoretical evidence to justify the use of

managerial skill as a moderator. This evidence of justification represents the main contribution of this research.

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